



GRIZZLY BEAR (*Ursus arctos*) HARVEST MONITORING IN NUNAVUT

Summary report

August 2025

Malik Awan
Department of Environment
PO Box 120
Arviat, Nunavut
X0C 0E0

The opinions in this report reflect those of the author and not necessarily those of the Government of Nunavut, Department of Environment. Reference to any specific type of gear and/or equipment does not mean that it is endorsed by the authors or the institutions they represent.

Summary

The purpose is to monitor the geographic distribution, sex, and age composition of grizzly bear harvest in Nunavut. Hunters were asked to return the lower jaw or whole skull, a piece of muscle, a small piece of the skin with hair (2x5cm), and to provide kill information (date, location, etc.) to their local Conservation Officer on a voluntary basis. Tooth samples were processed to determine age of the individuals. A total of 200 grizzly bears were reported harvested from 2020 to 2024, 109 from the Kitikmeot and 91 from the Kivalliq region. Grizzly bear harvest is tightly linked to hunter accessibility; in late winter/early spring hunters use snowmachines to access areas further from communities, and in summer ATVs are used to access areas around communities as well as boats to extend hunting off water channels. Grizzly bear harvest was concentrated in the western Kitikmeot, in the vicinity of Kugluktuk, Cambridge Bay and along the traditional travel route from the Cambridge Bay to the Bathurst Inlet area. Arviat and Baker Lake were the next highest contributors to the total harvest in the Kivalliq region.

Between 2019 and 2024, the harvest was dominated by a younger age class (<5 years) in the Kivalliq region and the proportion of adults in the harvest was 38%, while proportion of adults in Kitikmeot harvest was 56%. Long-term reported harvest trend (2010-2024) shows that in the Kitikmeot region, the number of bears harvested averaged 15 bears annually (SD = 7.3, range 4–32), and was significantly higher in 2021 (32 bears). Grizzly bear harvests in the Kivalliq have increased substantially since 2008. From 2010 to 2024, the harvest averaged 20 bears annually (SD = 6.9, range 9–34). The number of grizzly bears currently being harvested within the Kivalliq region may not be sustainable over the long term and may cause a population decline, highlighting the need to better understand the status of the population and determine viable harvest levels.

Akhait (*Ursus arctos*) an'ngujauhimajunik munariniq Nunavunmi

Naittumik Titiraqhimajuq

Pidjutikhaq munagiyaangat humiliqaak nunami nayugangit, qanuritmangaat, ukiungitlu akhat anguyauvakhimayut Nunavunmi. An'nguniaqtut apigijaujut utiquplugit agliguit niaquaplu hauninganik, ilagani nukiiip, mikkamik amirmit nujaqaqtumik (2x5cm) aktilanga, tunihijuqhatlu an'ngujarnik naunaitkutunik (ublua, humi, qanuqlu) An'nguhiqijimun Havaktianut piumaluni piluni ilikkut. Kigutingnik uuktuutikharnik hanaqiyauvaktun naunaiyaiyaangat ukiungit akhat. Atauttimun 200 ngujut aqhait unniudjatauut an'nguniaqtaujut talvanga 2020 min 2024 mun, 109 Kitikmeonit 92 lu Kivallirmin. Aqhanik an'nguniaqtaujut pidjutijut an'nguniaqtip pijaangnikkut; nunggunianut ukiumi/atulihaaliqtumi upin'ngaqhami an'nguniaqtit atuqhutik sikiituunik un'ngahiktuliariami nunamingnit, aujamilu haantaqhutik (ATVs) atuqtauvaktut pijaaginnik avataani nunallaanggit imaalu qajaqtuqhutiklu an'ngunahuariamingnik imakkut. Aqhanik an'nguniarnik ihumagigilluaqtaujut uataani Kitikmeot, haniani Kugluktup, Iqaluktuuttiaq in'ngilraangnitatlu aullaqviujait Iqaluktuuttarmin Kingaukmun nunainni. Arviat hamanilu Qamanittuaq tugliuyut amigainirit ikayuutait atauttimun anguniaqtamingnun Kivallirmi.

Qitqani 2019 2024 milu, an'nguniarniq amigaitqijaujut nukaqhiinni (<5 ukiuni) iKivallirmi ilanggatauq inirnit an'nguniaqtut 38 pusannujuq, ilanganittauq inirni Kitikmeoni an'nguniarniq 56 pusannujuq. Hivitunikkut unniudjaujut an'nguniarnirmik auladjutait (2010-2024) takupkaqtittijut Kitikmeoni, nampait aqhanik an'nguniaqtaujut imaa ittut 15 aqhaliqvaktut ukiuq tamaat (SD = 7.3, naunaitkuta 4-32), imaalu amigaitqijaupluni 2021 mi (32 aqhat). Aqhat an'nguniaqtaujut Kivallirmi amigaiqjuummiktut talvamin 2008. Talvanga 2010 talvanga 2024, tahapkuat aqhaliqvaktut qitqanit 20 nik ukiuq tamaat (SD = 6.9, naunaitkut 9-34). Nampanggit aqhait hadja an'nguniaqtaujut Kivallirmi aulalimaittungnaqhijut hivitunirmi ikiqlijuummingniagungnaqhijutlu, takupkaqtitaqhunilu ihariangnia kangiqhittiaqtuqhatigut qanurinmanggaatigut qaffiutigut ihumaliurnikkutlu ihuaqtuniklu an'nguniaqtaujuqhatigun aadlatkiingni.

Surveillance de la récolte de grizzli (*Ursus arctos*) au Nunavut

Sommaire

Le but de cette initiative est de surveiller la distribution géographique des récoltes de grizzli au Nunavut ainsi que leur répartition en ce qui concerne le sexe et l'âge. Pour y parvenir, nous avons demandé aux adeptes de la chasse de grizzli de remettre à leur responsable de la conservation le crâne entier de leur prise, sinon sa mâchoire inférieure, ainsi qu'un échantillon de muscle et un petit morceau de fourrure (2 cm x 5 cm) prélevés sur celle-ci, de même qu'à fournir, sur une base facultative, des renseignements sur leur récolte (date, emplacement, etc.). L'âge des sujets a été déterminé grâce à l'analyse des échantillons dentaires. Pour la période de 2020 à 2024, la récolte déclarée s'élève à 200 grizzlis, dont 109 proviennent de la région du Kitikmeot et 91 de la région du Kivalliq. La récolte de grizzlis dépend étroitement de la facilité d'accéder à leurs populations. Les adeptes de la chasse utilisent la motoneige pour accéder aux populations éloignées de leur localité à la fin de l'hiver et au début du printemps; en été, on recourt au véhicule tout-terrain (VTT) pour la récolte à proximité, et à l'embarcation pour étendre les zones de chasse aux abords des cours d'eau. Les prises ont majoritairement été récoltées dans l'ouest du Kitikmeot, aux alentours de Kugluktuk et de Cambridge Bay, de même que le long du parcours traditionnellement emprunté pour se déplacer entre la région de Cambridge Bay et celle de Bathurst Inlet. Quant à Arviat et à Baker Lake, dans la région du Kivalliq, elles figuraient au deuxième rang parmi les grands contributeurs à la récolte totale.

Entre 2019 et 2024, la majeure partie de la récolte de grizzli dans le Kivalliq représentait la catégorie des jeunes (<5 ans) et les adultes comptaient pour 38 % des prises régionales, alors que dans la région du Kitikmeot, les sujets adultes représentaient 56 % de la récolte. Les données recueillies sur une longue période (2010-2024) concernant les récoltes déclarées démontrent que dans la région du Kitikmeot, une moyenne de 15 grizzlis était récoltée par année (écart-type : 7,3; intervalle de variation : 4 à 32), ce qui était considérablement inférieur aux données pour 2021 (32 grizzlis). La récolte de grizzlis dans le Kivalliq a considérablement augmenté depuis 2008. Entre 2010 et 2024, sa moyenne était de 20 grizzlis par année (écart-type : 6,9; intervalle de variation : 9 à 34). Les actuelles habitudes de récolte du grizzli dans la région du Kivalliq pourraient ne pas être durables à long terme et entraîner un déclin de la population, d'où la nécessité de bien en comprendre la situation et de déterminer des quotas de récolte viables.

List of Figures

Figure 1. Proportion of males and females in reported harvest in Kitikmeot (a) and Kivalliq (b) from 2020 to 2024. 5

Figure 2. Distribution of reported grizzly bear harvest in Nunavut, from 2020 to 2024. 7

Figure 3. Reported grizzly bear harvest in Kivalliq and Kitikmeot regions between 2010 and 2024..... 8

Figure 4. Proportion of males and females in reported harvest in the Kitikmeot region, from 2010 to 2024.. 8

Figure 5. Proportion of males and females in reported harvest in the Kivalliq region, from 2010 to 2024. 9

Figure 6. Age and sex structure of the reported Kitikmeot grizzly bear harvest, from 2019 to 2024. 10

Figure 7. Age and sex structure of the reported Kivalliq grizzly bear harvest, from 2019 to 2024.. 11

Figure 8. Proportion of age classes in the Kitikmeot and Kivalliq reported harvest, from 2019 to 2024.. 12

List of Tables

Table 1. Reported grizzly bear harvest in Kitikmeot and Kivalliq regions between 2020 and 2024. 6

1.0 Introduction

Nunavut represents the northeastern edge of grizzly bear (*Ursus arctos*) distribution in Canada. Inuit observations, harvest records and research indicate an increase in numbers and range expansion eastward and northward (Clark 2007, Nirlungayuk 2011, Dumond et al. 2015, Awan et al. 2019, 2023, Barrueto et al. 2023, Harding et al. 2025, Awan et al. 2025). Grizzly bears are listed as a species of Special Concern under the federal Species at Risk Act (SARA) and bears are regularly harvested for subsistence, and a relatively small amount of revenue through trophy hunting and the sale of hides and parts. There are limited baseline data on grizzly bear distribution and density within Nunavut, in part because of the cost and challenge of surveying bears at low densities in vast and remote areas.

In Nunavut, grizzly bears are classified as both a furbearer and a big game animal under the *Nunavut Agreement*, and are classed as a Presumption as to Needs species where the full level of harvest is dedicated to Inuit (see 5.6.5(a) of the *Nunavut Agreement*). Currently, Inuit are able to harvest grizzly bears for subsistence use with no restrictions. The local Hunters and Trappers Organizations (HTOs) have the power to approve sport hunter harvesting of furbearers under 5.6.13(c) of the *Nunavut Agreement*. Therefore, the responsibility to limit harvesting of grizzly bears, fall strictly under the roles of HTOs and Regional Wildlife Organizations (RWOs). For a sport hunter (NU resident or a non-resident/non-resident foreigner) to hunt a grizzly, they would need HTO approval, along with a harvesting licence and a fur tag issued from the Government of Nunavut. They also need the services of an outfitter, with some specific exceptions under the Act/regulations.

For several years, hunters in the Kitikmeot have reported an increase in bear sightings and occurrences of bears in new areas (e.g. Victoria Island). Some Inuit hunters have suggested predation as a potential contributing factor in current caribou declines. Increasing grizzly bear populations was identified as a threat to caribou recovery. Similarly, hunters from Arviat, Baker Lake and Rankin Inlet have observed increasing grizzly bear numbers and voiced their concerns over problem bears around

communities, at cabins, meat caches and regard grizzly bears as a problem animal (Awan 2021, Harding et al. 2025). However, the number of cabins has increased significantly over the past 30 years, likely increasing conflicts compared to temporary tent camps (Awan et al. 2025).

Although territory wide surveys have not been conducted, in 2016 and 2017, Awan et al. (2019) sampled 4 grids (49 km × 49 km) in the Kivalliq Region of Nunavut using DNA-hair tripods and estimated a density of 3.5 bears/1,000 km² (95% CI = 2.1–6.1 bears/1,000 km²). We sampled the western mainland of the Kitikmeot Region using DNA hair snagging methods from 2021 to 2023 and updated the earlier results (2008/09, Dumond et al. 2015) and sampled the areas west of Bathurst Inlet in 2022 and area around and south of Bathurst Inlet in 2023. The overall density estimate from our 2021–2023 study is 5.92 bears per 1,000 km² (CI = 5.02–6.83, Awan et al. 2025). Monitoring of grizzly bear harvest numbers, sex and age composition of the harvested bears is fundamental to the conservation of the species and its sustainable use.

2.0 Methods

Subsistence harvesting reports are voluntary and, with few exceptions, hunters have been reporting the harvest with good return rates to-date. Hunters in the Kivalliq and Kitikmeot regions were asked to return the lower jaw or whole skull, a piece of muscle, 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). Age results from the 2018-2019 season (2019) have been included in all analysis presented in this report which take into consideration the age of the individuals. The harvest year was assigned as the year at the end of the prescribed harvesting season, for example, 1 July 2019—30 June 2020 was the 2020 harvest year/season.

3.0 Results and Discussion

A total of 200 grizzly bears were reported harvested from the 2020 to 2024 harvest seasons, 109 (males = 80, females = 19 and unknown sex = 10) from the Kitikmeot and 91 (males = 57, females = 33 and unknown sex = 1) from the Kivalliq region (Fig. 1).

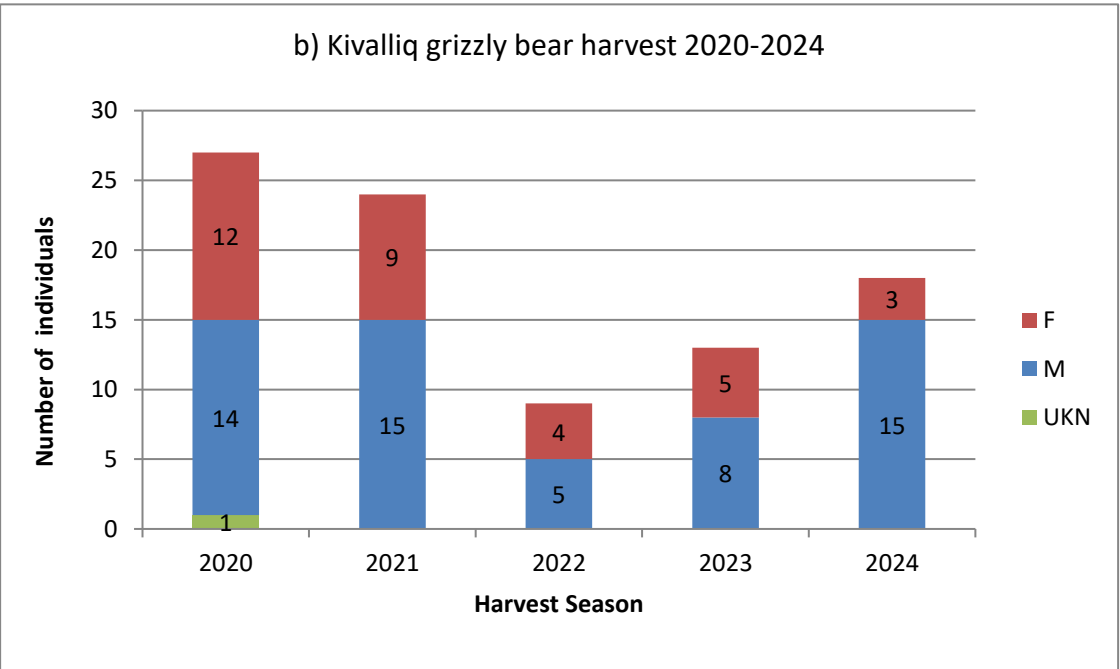
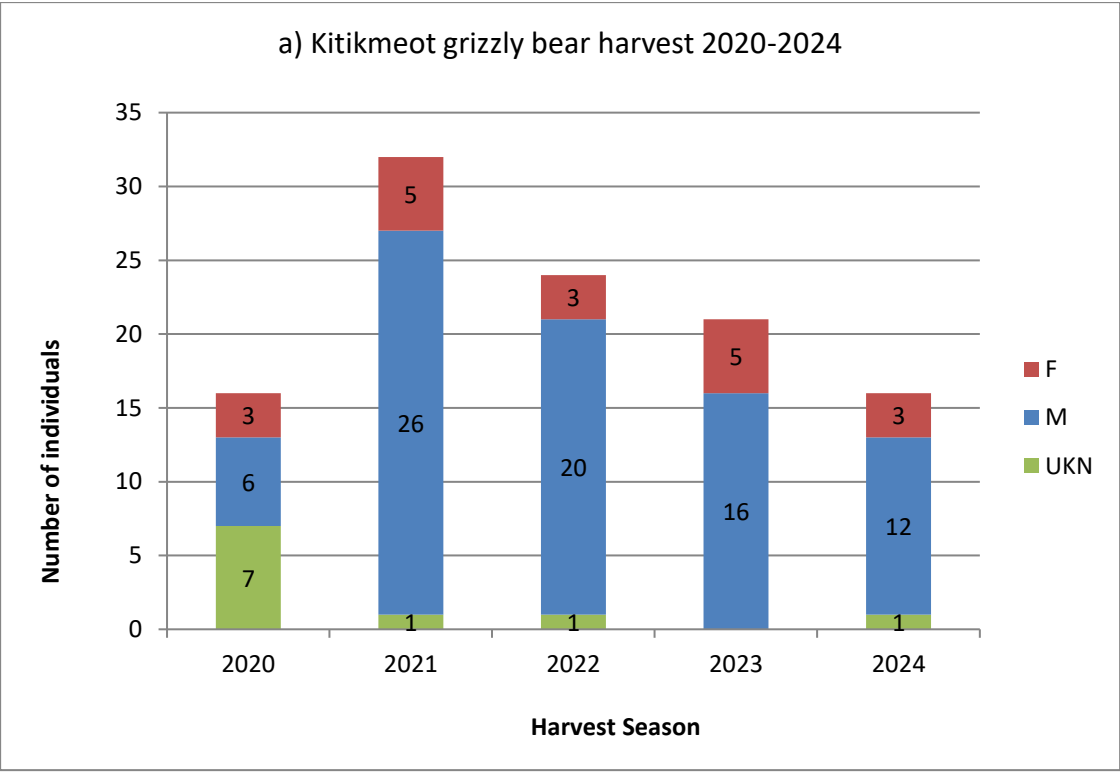


Figure 1: Proportion of males and females in reported harvest in Kitikmeot (a) and Kivalliq (b), from 2020 to 2024.

The known harvest, by region and community is summarized in Table 1. Most grizzly bears were harvested in the western Kitikmeot, in the vicinity of Kugluktuk, Cambridge Bay and along the traditional travel route from the Cambridge Bay to the Bathurst Inlet area, and few in the eastern communities. Arviat and Baker Lake were the highest contributors to the total harvest in the Kivalliq region (Fig. 2, Table 1). Grizzly bear harvest is tightly linked to hunter accessibility; in late winter/early spring hunters use snowmachines to access areas further from communities, and in summer all terrain vehicles (ATVs) are used to access areas around communities as well as boats to extend hunting off water channels.

Table 1: Reported grizzly bear harvest in Kitikmeot and Kivalliq regions between 2020 and 2024. RH = Regular Hunt, SH = Sport Hunt.

Community	2020		2021		2022		2023		2024	
	RH	SH	RH	SH	RH	SH	RH	SH	RH	SH
Cambridge Bay	7		9		9	5	5	4		7
Gjoa Haven					1					
Kugaaruk							1			
Kugluktuk	9		23		5	4	9	2	7	2
TOTAL KITIKMEOT	16		32		15	9	15	6	7	9
Arviat	15		20		3		6		7	
Baker Lake	12		2		4	1	3	1	7	1
Naujaat					1					
Rankin Inlet			1				3		3	
Whale Cove				1						
TOTAL KIVALLIQ	27		23	1	8	1	12	1	17	1

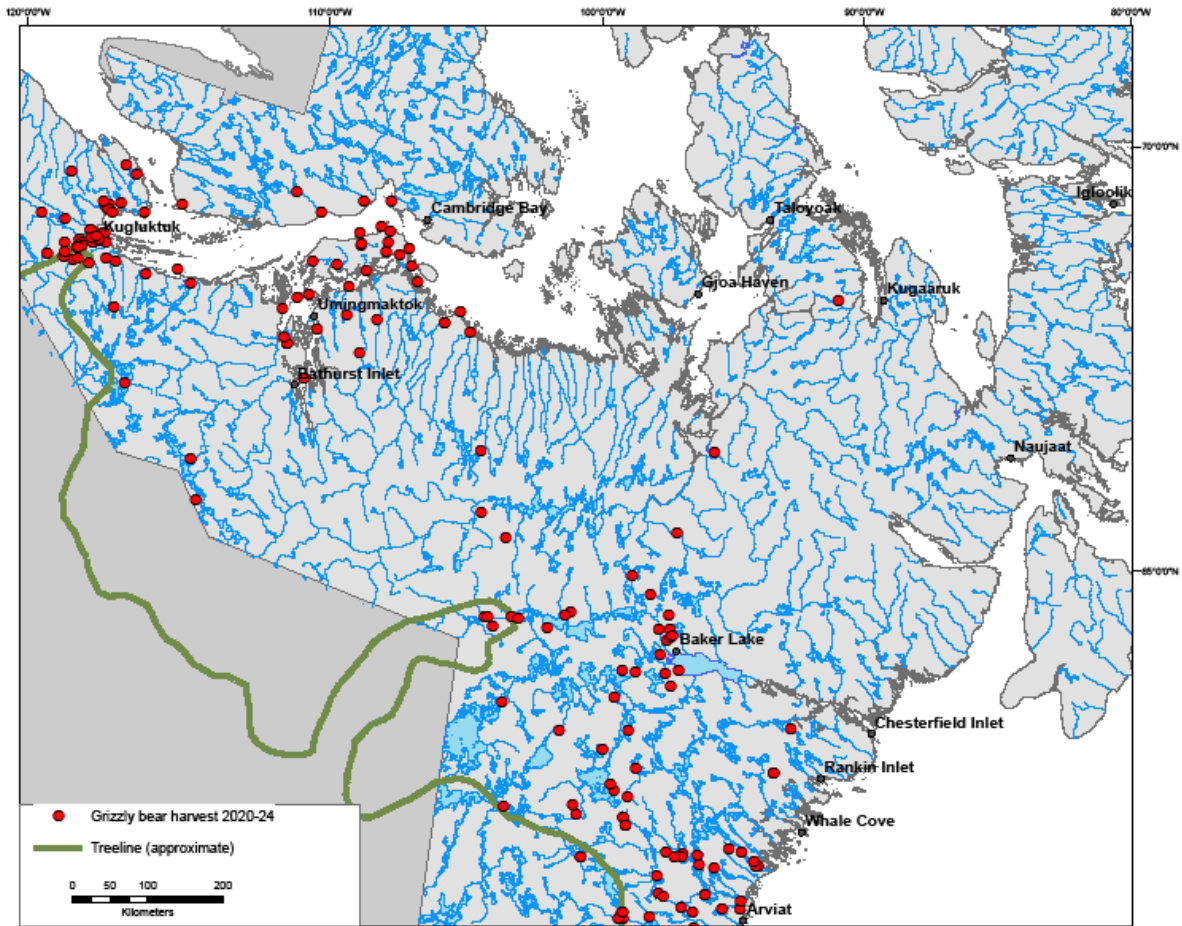


Figure 2: Distribution of reported grizzly bear harvest in Nunavut, from 2020 to 2024.

Long-term reported harvest trend of 15 years (2010-2024) shows that in the Kitikmeot region, the number of bears harvested averaged 15 bears annually (SD = 7.3, range 4–32; Fig. 3), and was significantly higher in 2021 (32 bears). Reported grizzly bear harvests in the Kivalliq have increased substantially since 2008. From 2010 to 2024, the harvest averaged 20 bears annually (SD = 6.9, range 9 –34; Fig. 3).

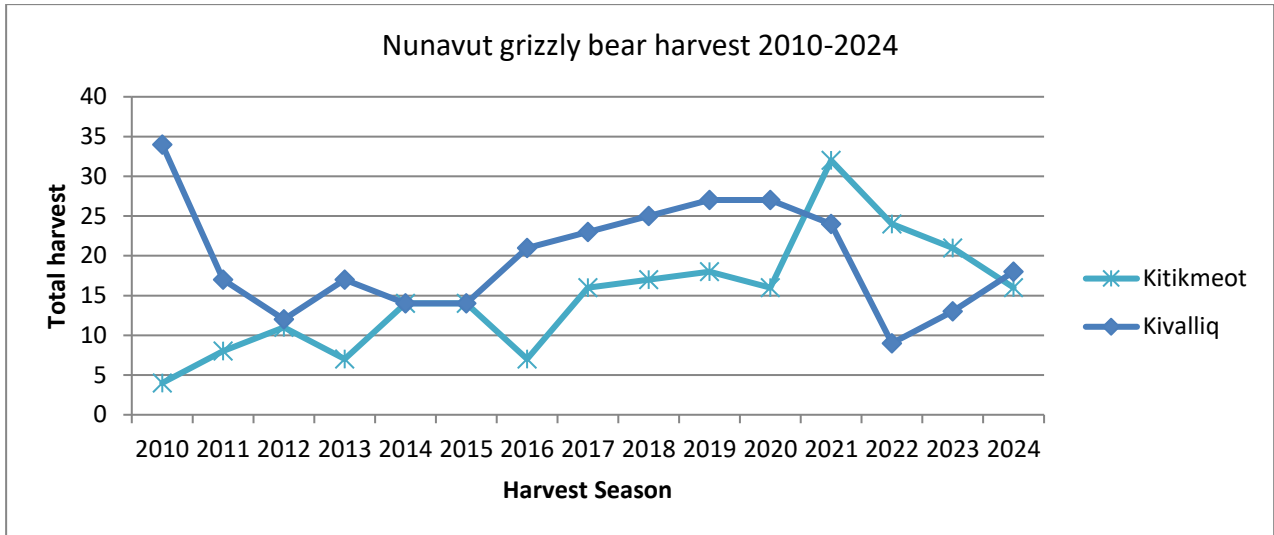


Figure 3: Reported grizzly bear harvest in Kivalliq and Kitikmeot regions between 2010 and 2024.

The male to female ratio in the harvest has been relatively stable for the last 15 years in the Kitikmeot region with males and females representing an average of 85% and 15% of the total harvest respectively (Fig. 4). Males composed >80% of the harvest in most of the last 15 years, indicating a stable and healthy population.

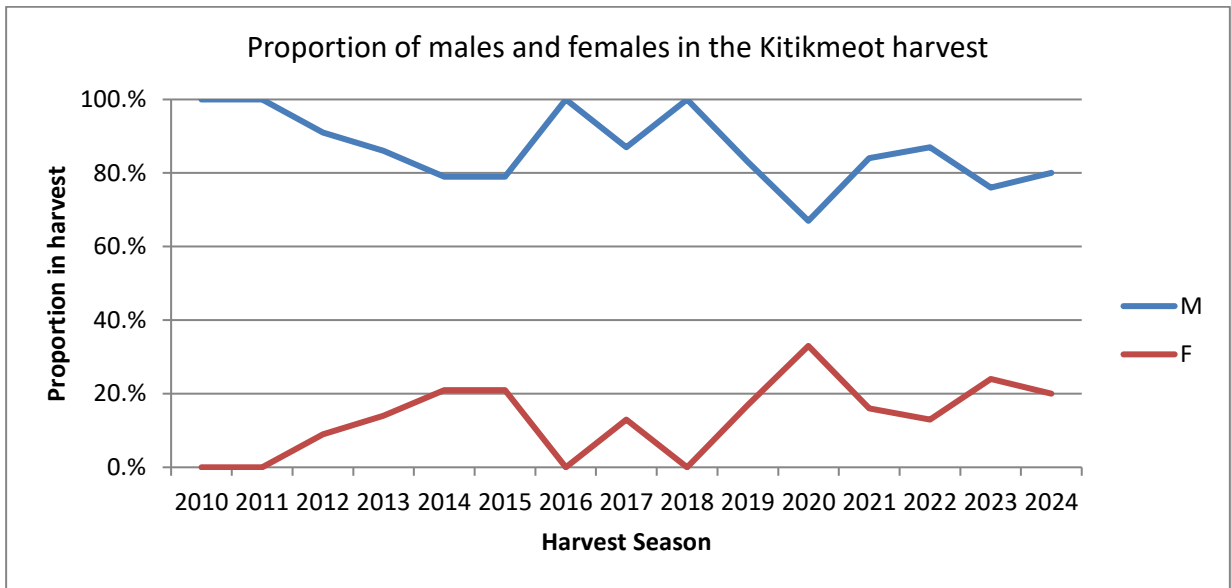


Figure 4: Proportion of males and females in reported harvest in the Kitikmeot region, from 2010 to 2024.

In the Kivalliq, a similar pattern was up to 2009 harvest season, with an average of 82% and 18% of males and females respectively in the harvest (Awan 2021). However, the proportion of females in the Kivalliq harvest increased to 32% and 71%, for the 2010 and 2011 seasons respectively, before dropping to average 29% from 2012 to 2024 season. A decline in the percentage of males taken in the 2011 harvest suggests fewer males are present (Fig. 5).

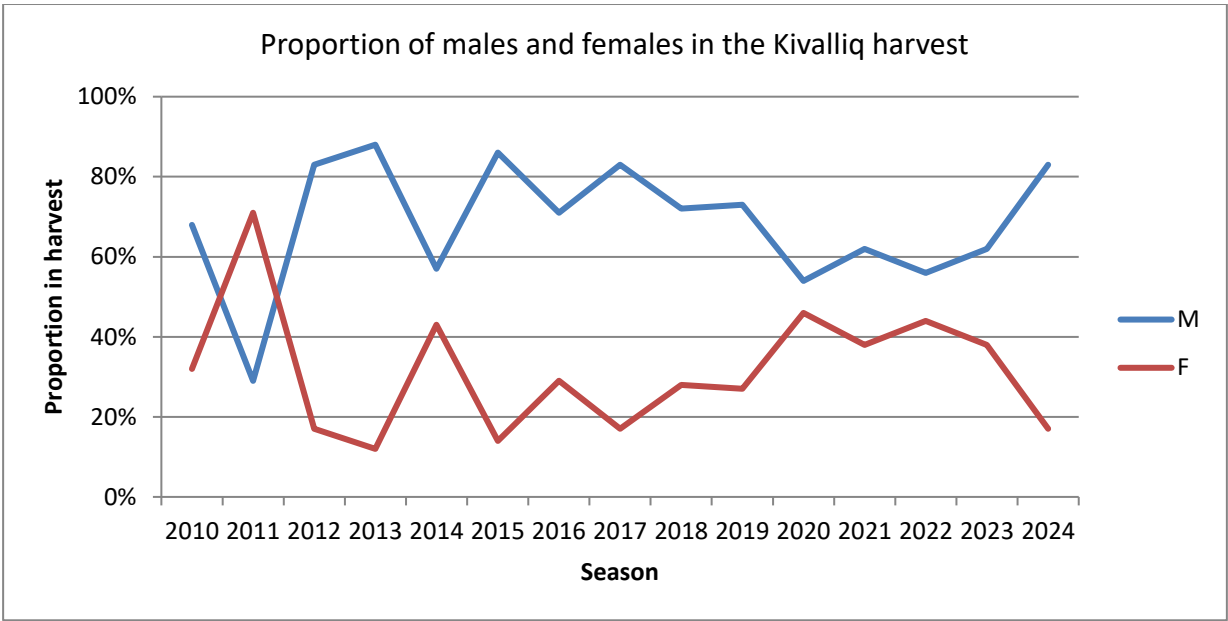


Figure 5: Proportion of males and females in reported harvest in the Kivalliq region, from 2010 to 2024.

The ages of harvested grizzly bears in Kitikmeot region ranged from 1 year to 23 years (Fig. 6). The oldest female (23 years) was killed by a hunter in 2020 in the Kugluktuk area.

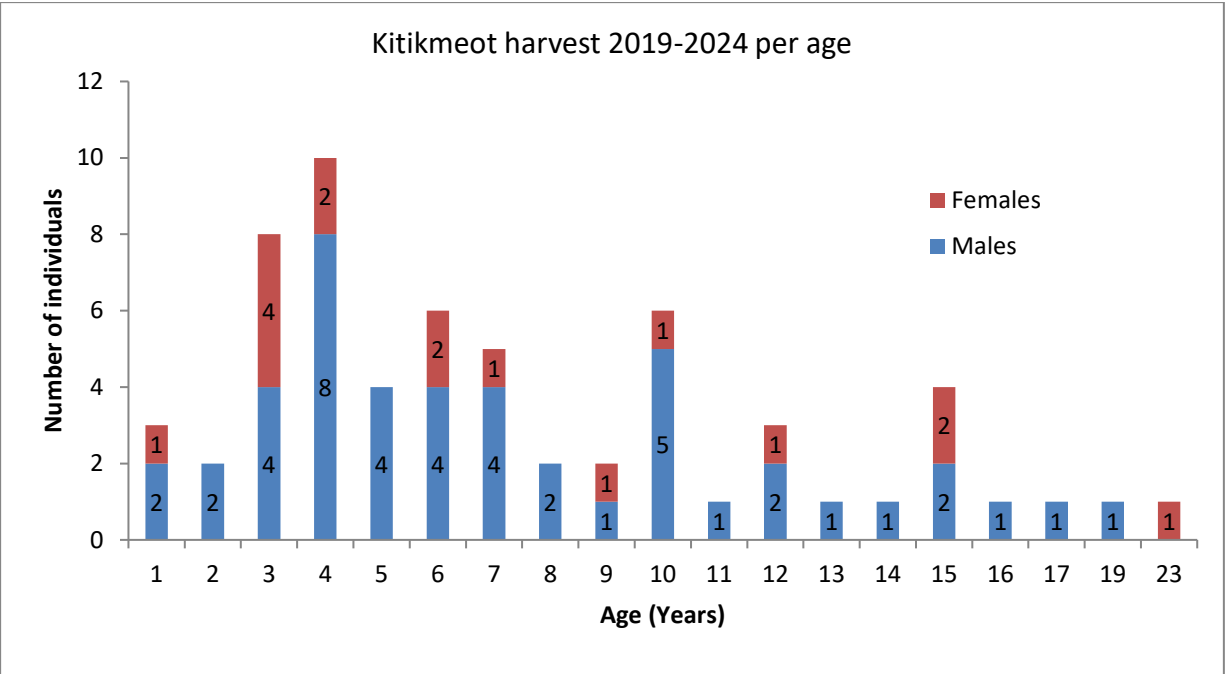


Figure 6: Age and sex structure of the reported Kitikmeot grizzly bear harvest, from 2019 to 2024.

The ages of harvested grizzly bears in Kivalliq region ranged from 1 year to 24 years (Fig. 7). The oldest male (24 years) was harvested in September 2021 about 80 km northeast of Arviat near the coast.

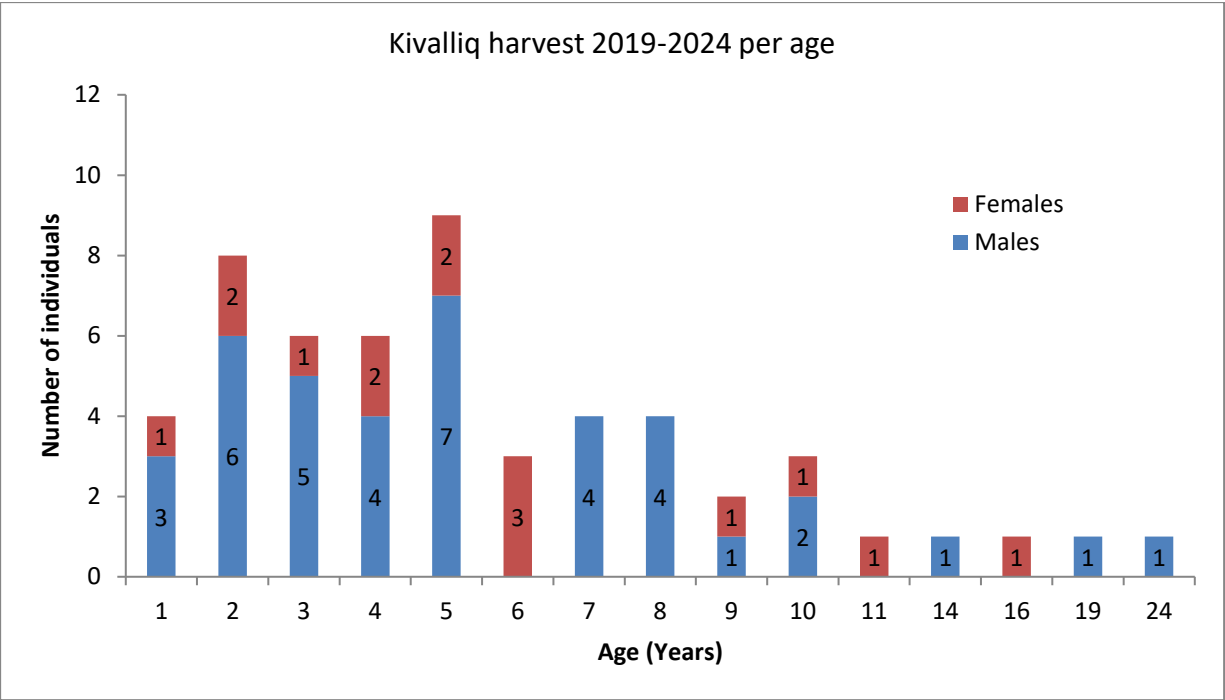


Figure 7: Age and sex structure of the reported Kivalliq grizzly bear harvest, from 2019 to 2024.

The average age of the grizzly bears harvested from 2019-2024 in the Kitikmeot was 7.48 years (n = 62) old, compared to 5.81 years (n = 55) old in the Kivalliq for the same period. The proportion of adults in the Kivalliq harvest was 38%, while proportion of adults in Kitikmeot harvest was 56% (Fig. 8). In both regions, the average age in the harvest slightly increased compare to 2013-2018 harvest period (Kitikmeot = 7.97 years, Kivalliq = 5.89 years; Awan 2021).

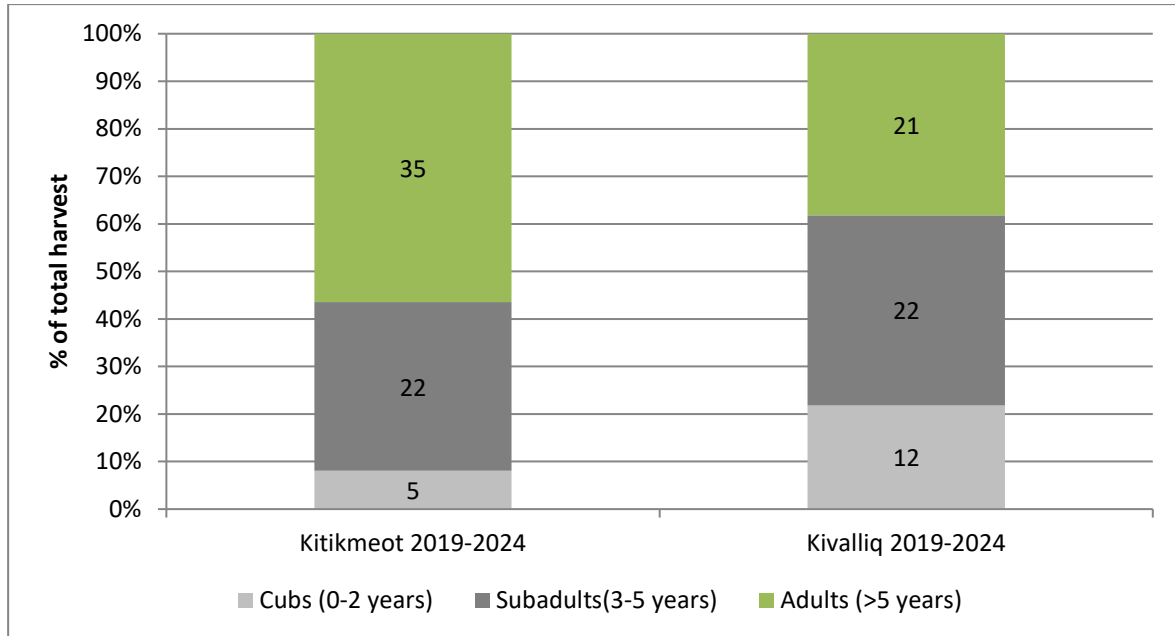


Figure 8: Proportion of age classes in the Kitikmeot and Kivalliq reported harvest, from 2019 to 2024.

In Nunavut, grizzly bears are being harvested both as part of traditional/subsistence (regular hunts) activities and as part of commercial activities (sport hunts). In the Kitikmeot region, approximately 28% of harvested grizzly bear harvest from 2010-2024 were taken in sport hunts, 93% of which were males. For the same period, in the Kivalliq region, approximately 3% were taken as sport hunts, 86% of which were males. Apparently, this low sport hunts success, seems attributed to logistic constraints, non-availability of sport hunters or dearth of high trophy quality. Regular harvest is increasing, grizzly bears on tundra have low reproductive potential (McLoughlin et al. 2003) and cannot afford high subsistence and sport hunt at the same time.

The large home range of males compared to females, and the fact that their highest movement rates happen during spring probably increase their vulnerability to harvest which occurs at the same time of year (den emergence to end of June) (McLoughlin et al. 1999). 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 harvest in the Kitikmeot between 2020 and 2024 was 22 bears per year. 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). Awan et al. (2025) population estimate was over 900 grizzly bears in the 156, 490 km² study area of the western mainland Kitikmeot Region. Overall density estimate from our 2021-2023 study is 5.92 bears/1,000 km² in the western mainland of the Kitikmeot Region (Awan et al. 2025). Based on those densities and from the demographic parameters of barren ground grizzly bears in the Kitikmeot region (McLoughlin and Messier 2001), the current harvest thus appears to be within the recommended limits and should result in a stable population.

The average age and age distribution of the 2019-24 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. However, in 2021 the Kitikmeot harvest was 32 bears (Table 1), suggesting careful monitoring of harvest is warranted.

Similarly to the Kitikmeot region, the sex ratio in the Kivalliq harvest has historically been biased towards males representing approximately >80% of the total harvested individuals up to 2009 harvest season, 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 future generations.

Due to limited food resources, barren-ground grizzly bears on the tundra have very large spatial requirements (McLoughlin et al. 2002a) and later ages of maturation than elsewhere, making them more susceptible to over-harvest and disturbance, given their

overall low productivity and slow recovery potential (McLoughlin et al. 2003, McLellan et al. 2017). There is concern that the cumulative effects of various human-caused mortalities and increasing development on the land may cause the grizzly bear population to decline in Nunavut.

4.0 Acknowledgments

Thank you to everyone involved in the collection of the harvest information presented here – the hunters, the HTOs, and the Conservation Officers.

5.0 Literature cited

Awan, M. 2021. Grizzly bear (*Ursus arctos*) harvest monitoring in Nunavut. Summary report. Wildlife Research Section, Department of Environment, Igloolik, NU. March 2021.

Awan, M., M. Efford, and J. Boulanger. 2019. Estimates of grizzly bear density from mark-recapture DNA sampling, Kivalliq Region, Nunavut, 2016-2017. Draft report, Department of Environment, Wildlife Research Section, Igloolik, NU. 33pp.

Awan, M., M. Efford, J. Boulanger and K. G. Poole. 2023. Grizzly bear DNA mark—recapture sampling in the Western Kitikmeot Region of Nunavut, 2021. Department of Environment, Government of Nunavut. 57pp.

Awan, M., J. Boulanger, M. Efford, and K. G. Poole. 2025. Grizzly Bear DNA Mark-Recapture Sampling in the Western Kitikmeot Region of Nunavut, 2022-2023. Department of Environment, Government of Nunavut. 65pp.

Barrueto, M., T. D. Jessen, R. Diepstraten, and M. Musiani. 2023. Density and genetic diversity of grizzly bears at the northern edge of their distribution. *Ecosphere* doi.org/10.1002/ecs2.4523

Clark, D. A. 2007. Local and regional-scale societal dynamics in grizzly bear conservation. Dissertation, Wilfrid Laurier University, Waterloo, Ontario, Canada.

Dumond, M., J. Boulanger, and D. Paetkau. 2015. The estimation of grizzly bear density through hair-snagging techniques above the tree line. *Wildlife Society Bulletin* 9999:1-13; DOI:1002/wsb.520.

Harding, L., E. Arnalok, R. Toolootook, M. Awan, T. Shah, M. Sidloski and D. Clark. 2025. Participatory assessment of aklak (Grizzly bear, *Ursus arctos*) abundance and distribution in the Kivalliq Region, Nunavut. Report to Department of Environment, Government of Nunavut.

Matson, G. M. 1981. Workbook for cementum analysis. Milltown, Montana: 31 pp.

McLellan, B. N., G. Mowat, T. Hamilton, and I. Hatter. 2017. Sustainability of the grizzly bear hunt in British Columbia, Canada. *Journal of Wildlife Management* 81:218-229.

McLoughlin, P. D., R. L. Case, R. J. Gau, S. H. Ferguson, and F. Messier. 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., R. L. Case, R. J., Gau, H. D., Cluff, R. Mulders, and F. Messier. 2002. Hierarchical habitat selection by barren-ground grizzly bears in the central Canadian Arctic. *Oecologia* 132:102–108.

McLoughlin, P. D., M. K. Taylor, H. D. Cluff, R. J. Gau, R. Mulders, R. L. Case, and F. Messier. 2003. Population viability of barren-ground grizzly bears in Nunavut and the Northwest Territories. *Arctic* 56:185–190.

Nirlungayuk, G. 2011. Aklah, akha, grizzly bear, perspectives from Inuit of Kugluktuk and Baker Lake elders. Nunavut Wildlife Management Board, Iqaluit, NU. Website: <https://www.nwmb.com/en/public-hearings/2008/sep-10-2008-grizzly-bear-public-hearing> [Accessed March 2020].

Sidorowicz, G. A. and F. F. Gilbert (1981). "The Management of Grizzly Bears in the Yukon, Canada." *Wildlife Society Bulletin* 9(2): 125-135.