Caribou & Muskoxen Harvest Advice for
Autumn 2012 / Winter 2013

ADVICE DOCUMENT FOR THE GREENLAND GOVERNMENT

by

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Introduction

This document is the Greenland Institute of Natural Resources’ (GN) biological recommendation to the Greenland government’s Department of Fisheries, Hunting and Agriculture (APNN) regarding the caribou (*Rangifer tarandus* spp.) harvest in West and Northwest Greenland, as well as muskoxen (*Ovibos moschatus*) harvest in all of Greenland, for the autumn 2012 and winter 2013 for the following regions:

**Caribou:** Naternaq (1), North (2), Central (3), South (4-5), Paamiut (6-7), Inglefield Land & Prudhoe Land (10), Olrik Fjord (9), Nuussuaq Halvø (8) and Ivittuut (11). Numbers in parentheses are the harvest region number (Fig. 1).

**Muskoxen:** Inglefield Land, Kap Atholl, Svartenhuk Halvø, Naternaq, North (2), Central (3), Ivittuut (11), as well as Northeast Greenland (Jameson Land & Inner Scoresbysund Fjord). Numbers in parentheses are the harvest region number (Fig. 2).

The recommendations presented in this document pertain, without exception, only to the coming harvest season, i.e., autumn 2012 and winter 2013.

As with advice documents in previous years, we recommend that caribou and muskoxen hunters harvest the same number of females as males, so as to maintain the population’s natural sex ratio, which will ensure genetic diversity for the future. Further, a continued and greater cooperation aimed at raising the frequency of hunter harvest reporting is desired.

Background for the Greenland Institute of Natural Resources’ biological advice

The request from the Department of Fisheries, Hunting and Agriculture (APNN) to Pinngortitaleriffik – Greenland Institute of Natural Resources, regarding biological advice for the harvest of caribou and muskoxen in the autumn of 2012 and the winter of 2013 contained the following questions:

1) Are there any changes in the advice for 2012/2013 from previous years in relation to each management region?
2) Can the Greenland Institute of Natural Resources recommend a winter harvest? If so, in which regions or hunting areas?
3) Does the Greenland Institute of Natural Resources have results from the March 2012 caribou survey?
4) Did the Greenland Institute of Natural Resources see muskoxen during the March 2012 caribou survey of the Nuuk area?
5) Can the Greenland Institute of Natural Resources offer a recommendation regarding hunting muskoxen in the Nuuk area?
Figure 1. Caribou populations in West- and Northwest Greenland with hunting areas and region names.
Figure 2. The nine muskoxen populations where hunting was permitted in 2011 are given in red. An area’s size or shape is approximate and represents a population’s use of an area rather than abundance. For example, the relatively small Kangerlussuaq area contains the largest muskoxen population in West Greenland. The large muskoxen population in Northeast Greenland’s National Park is not presented on this map because hunting is forbidden. A smaller population of unknown size occupying the Nuuk area is given by the blue ring.
Biological Recommendations

Q 1: Are there any changes in the advice for 2012/2013 from previous years in relation to each management region?

CARIBOU:
Our recommendations, with few exceptions, remain the same as the 2011 advice, as we have no new data for most of the regions. We have new (2012) population estimates and herd structure for the South region (hunt areas 4, 5) as well as a re-evaluation of the 2010 population estimates for caribou in the North and Central regions (hunt areas 2, 3), where caribou numbers have been adjusted down. Both are reasons behind the recommended closing of the winter/spring harvest for commercial and sport hunters in the period 1 January to 28 February, and a prohibition against use of motor vehicles (skidoo/ATV) when hunting.

MUSKOXEN: Our recommendations remain the same as the 2011 recommendations, as we have no new data.

Q 2: Can the Greenland Institute of Natural Resources recommend a winter harvest? If so, in which regions and hunting areas?

CARIBOU:
Winter / spring harvesting is not recommended in all hunting areas over the entire of West and Northwest Greenland, with three exceptions:

1) A winter / spring harvest may be permitted for Kangerlussuaq-Sisimiut (North region – hunt area 2) from 1 January until 28 February because the number and density of caribou remains too high. Once the density of caribou in the Kangerlussuaq-Sisimiut population approaches 1.2 / km$^2$ there will no longer be a basis for permitting a winter hunt.

2) Trophy hunting, regardless of the area, is exempt from this prohibition, because the number of caribou shot during trophy hunting is minimal and considered of little consequence for the population.

3) Inglefield Land / Prudhoe Land and Olrik Fjord: a winter harvest quota in a defined time period and area can be considered / discussed in consultation with the local hunter. Skidoos should not be used for hunting.

Background:
Previously winter / spring harvests were permitted for many of the West Greenland regions; this was based on the too high caribou densities. The high densities caused overgrazing. Thus a reduction of caribou abundance was desired in all the West Greenland populations to bring the density down to ca. 1.2 caribou / km$^2$. This goal is expected to be in balance with the carrying capacity of the range (Kingsley & Cuyler 2002).

Today, 2012, caribou density has approached the goal for most regions in West Greenland, with the exception of Kangerlussuaq-Sisimiut (KS) (North region – hunt area 2). The number and density for KS has been high for many years. The re-evaluation of the KS 2010 survey results still yield a high
abundance, estimated at ca. 60,000 caribou, and a density of ca. 4 / km² (Table 2), with the subsequent negative effects on the population, e.g., poor calf recruitment. Calf recruitment could be strengthened for KS if the number and density of animals was reduced to 1.2 / km². Considering this, a winter harvest of the KS caribou can be permitted in 2013.

The winter / spring period is decisive for an animal’s survival, primarily because there is less food, which is also less available. This can have negative effects on body condition and reproduction, e.g., how well the parturient cows can manage up to calving. Peace and quiet from disturbance during the winter and spring period (i.e., 1 January until summer) results in less energy used (daily movements), as well as greater time available for energy intake (grazing) and absorption (rumination / digestion). Disturbance, for example in the form of caribou hunting from skidoo or ATV, increases caribou energy expenditure (flight responses) while intake and absorption are reduced. If a large number of individuals are affected, it can weaken a population’s general health. Hunting from motor vehicles can have several negative effects. Animals avoid preferred critical winter habitat to seek refuge in areas that can be less suitable. Being less suitable, caribou densities would be too high in relation to the carrying capacity there. High animal density also increases exposure to infectious diseases and parasites. Long-term effects on the population could encompass more than we at the present time can predict.

MUSKOXEN:
Winter / spring harvesting of muskoxen, as a general rule, is not recommended in all hunting areas (for the same reasons as for caribou), with these exceptions:

1) A winter / spring harvest may be permitted for Kangerlussuaq-Sisimiut (North region – hunt area 2) from 1 January until 28 February.

2) Trophy hunting, regardless of the area, is exempt from this prohibition, because the number of muskoxen shot is minimal and considered of little consequence for the population.

3) The hunting areas of Inglefield Land, Kap Atholl, Jameson Land, Indre Scoresbysund Fjord and Ivittuut: a winter harvest quota in a defined time period and area can be considered / discussed in consultation with the local hunter. Skidoos should not be used for hunting.

Q 3: Does the Greenland Institute of Natural Resources have results from the March 2012 caribou survey?

CARIBOU:
The South region has two sub-populations, Ameralik and Qeqertarsuatsiaat. On the whole, the caribou in the region appeared healthy with both a good calf recruitment and sex ratio of bulls to cows. The March 2012 survey gave an overall density of ca. 1.3 caribou / km², which is similar to the goal. The Ameralik sub-population is estimated to ca. 11,700 caribou (90 % CI: 8,500 – 16,000; CV = 0.18), with a density of 1.5 caribou/km². The Qeqertarsuatsiaat sub-population is estimated to ca. 4,800 caribou (90 % CI: 3,400 – 6,800; CV = 0.21), with a density of 0.91 caribou/km². The herd structure, which was surveyed chiefly on the Ameralik population, resulted in an excellent 28.2 % calves (9-months old) and a splendid calf recruitment of 63.5 calves per 100 cows, as well as a fine sex ratio of ca. 62 bulls per 100 cows.
Q 4: Did the Greenland Institute of Natural Resources see muskoxen during the March 2012 caribou survey of the Nuuk area?

GN did not see muskoxen during the caribou survey of the Nuuk area March 2012. However, staff from the Greenland Climate Research Centre observed and photographed a group of 18 animals at 64°25.830’ N: 49°51.529’ W. The animals were at the mouth of the Sarqarssuaq Valley just where it meets the fjord (Fig. 3). This group was observed several times from the 6-19 February 2012.

![Figure 3. Muskoxen on the north side of the Sarqarssuaq Valley at shore of the Isfjord. Photo: Ivali Lennert.](image)

Q 5: Can the Greenland Institute of Natural Resources offer a recommendation regarding hunting muskoxen in the Nuuk area?

Since muskoxen are not indigenous to the Nuuk area, the real question is – what is the management goal for this population: extirpation, maintain low abundance, or allow growth in numbers?

In 2011 GN was asked by APNN about the status of the muskoxen population between the Godthåbsfjord and the Sukkertoppen Ice Cap. The 2011 answer was that the population size was unknown. This answer is unchanged. Since 1998 there have been several independent observations reported of muskoxen around Nuuk. All the animals in the Nuuk area can only have arrived here from the large Kangerlussuaq population to the north. Through time animals have crossed the Sukkertoppen Ice Cap and established themselves – even around Nuuk.
Since 2001 the Nuuk area has been covered six times by aerial caribou surveys. These surveys are done by low-flying helicopter, however, muskoxen have not been observed. In contrast, on similar caribou surveys in Qeqqata Municipality, muskoxen are often observed on transects around Kangerlussuaq. This is probably because the Nuuk area muskoxen population is of modest size relative to the one in Qeqqata Municipality. For comparison, the muskoxen populations are modestly sized in the hunting areas of Svartenhuk Halvø, Kap Atholl, Naternaq and Ivittuut, and nevertheless small quota harvests are permitted each year.

If the desire is management that ensures greater population abundance than at present and with more rapid growth, then GN recommends postponing quota harvests. If the desire is management intending to maintain the current number of muskoxen in the Nuuk area, then a small, autumn, quota harvest could be permitted. That being said, the population may still increase in number. Since muskoxen population size in the Nuuk area is modest, GN does not recommend a winter harvest of muskoxen. Deciding on a possible autumn harvest quota could be based on the low initial quotas permitted for Svartenhuk Halvø and Naternaq (i.e., quotas from ca. 2002 and 2004).

References


Appendix 1
Re-evaluation of population estimates from 2010

Re-evaluated estimates for the caribou population surveyed by helicopter in 2010, since the effective strip-width has been demonstrated to have been closer to 500 m to either side of the helicopter. The

The new estimates for the Akia-Maniitsoq and Kangerlussuaq-Sisimiut populations are presented below (Tables 1, 2). As with the original estimates, these new estimates are conservative, because ‘blind-ground’ constitutes a substantial negative bias for the survey. Blind-ground is those strip areas not available to the observers because of landscape features (topography), thus hiding caribou, which are otherwise within the strip width of the transect.

Table 1. Re-evaluated and original population estimates for Akia-Maniitsoq caribou, Central region, 09-13 March 2010.

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<th>Parameter</th>
<th>Original estimate (600 m strip)</th>
<th>Re-evaluated estimate (1000 m strip)</th>
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<tr>
<td>Bootstrapped population estimate</td>
<td>23.989</td>
<td>14.300</td>
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<td>90% Confidence Interval (CI)</td>
<td>16.667 – 31.311</td>
<td>10.300 – 18.800</td>
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<td>Bootstrapped density (caribou / km²)</td>
<td>1.6</td>
<td>ca. 1.0</td>
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Table 2. Re-evaluated and original population estimates for Kangerlussuaq-Sisimiut caribou, North region, 03-08 March 2010.

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<th>Parameter</th>
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<th>Re-evaluated estimate (1000 m strip)</th>
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<td>90% Confidence Interval (CI)</td>
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<td>Bootstrapped density (caribou / km²)</td>
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