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Third Standing Non-Detriment Findings for Exports from Greenland of Products derived from Atlantic walrus (*Odobenus rosmarus rosmarus*)

A negative Non-Detriment Findings report (NDF) for Atlantic walrus (*Odobenus rosmarus rosmarus*) in Greenland was issued in 2008, when there was insufficient data to determine the status of all the three walrus stocks from Greenland and the catches were relatively high. A second, this time positive, NDF was issued in 2009, after a series of studies carried out by the Greenland Institute of Natural Resources (GINR) and financed by the Danish Ministry of Environment and the Government of Greenland allowed the North Atlantic Marine Mammal Commission (NAMMCO) to provide with management advice for all stocks, and the Government of Greenland implemented catch limits that were in accordance with the advice. In the fall 2014, the CITES Management Authority requested a third, updated NDF from the Scientific Authority. This document is the third NDF, based on up to date information on assessments, advice, quotas and catches of walrus in Greenland.

As the CITES Scientific Authority of Greenland, GINR issues a positive NDF if, and only if, it can be documented that the stock in question is managed in a sustainable way. In determining the extent to which harvesting of walrus in Greenland is sustainable or not, the following has been considered.

Status and biological advice

There are three populations of walrus in Greenland; these were assessed most recently by a working group under NAMMCO's Scientific Committee in November 2013 (NAMMCO 2013), with the following conclusions:

Present status

West Greenland-Southeast Baffin Island
Part of this stock winters in the Davis Strait in West Greenland and summers in Southeast Baffin Bay. The range of the stock extends also into the Hudson Bay. The total number of walruses in this stock is unknown, but those wintering in Greenland have been counted with aerial surveys, the newest of which was carried out in 2012 (Table 1). A model using catch data and a series of surveys suggests that the stock wintering in West Greenland decreased from about 4,000 walruses in 1960 (95 % CI 1,210 – 18,600) to about

2,360 in 2007 (95 % CI 1,720 – 3,280), when catches were substantially reduced, and thereafter increased to a modelled estimate of 2,630 in 2014 (95 % CI 1,640 – 3,790).

Baffin Bay
The range of the Baffin Bay walrus stock includes Qaanaaq, in West Greenland and Ellesmere and Devon Islands in Nunavut, Canada. A considerable part of the walrus from this stock spend the winter in the shallow waters of the North Water Polynya, close to Greenland and migrate west to spend summer close to Nunavut. The model that best explained the data estimated that the stock declined by 63% from the 1960's to 2007, when decreased catches subsequently allowed the stock to increase. The abundance for 2014 estimated by the model was 1,430 walrus (95% CI 999 – 2,170).

East Greenland
The Walrus stock from East Greenland has apparently recovered from historical catches and is currently not depleted. The modelled abundance for 2014 was 1,400 (95% CI: 720-3,200).

Biological advice

According to NAMMCO's advice, sustainable harvest levels should target a probability of 70% or larger for increasing stock sizes. To meet this target, yearly removals from 2014 to 2018 should not exceed 100 walruses from the West Greenland – Southern Baffin Island stock and 93 walruses from the Baffin Bay stock. These numbers include catches from Greenland, catches from Canada and animals not landed because they were struck and lost. The current quotas of 20 walrus per year in East Greenland are considered sustainable.

The report from NAMMCO's working group on walruses mentions as well that there is no biological argument against the carrying over of unused quotas from one year to the next, as long as potential carryovers do not accumulate over several years and across assessments.

New Data
There is no new advice since the NAMMCO Scientific Committee Working Group on Walrus carried out the assessment in 2013. However, new data that is worth mentioning is summarized below.

Struck & Lost
There was no updated information about struck and lost, or the proportion of animals that are wounded but not caught when NAMMCO carried out the assessment in 2013. With basis on data from before the mid 1990's, NAMMCO's models assumed an average loss rate of about 15% for Baffin Bay and West Greenland, and 11% for East Greenland. The working group also recognized that loss rates may be lower in some areas and in some types of hunts.

Field work carried out in Qaanaaq by the Greenland Institute of Natural Resources (GINR) between 2010 and 2015 has shown that walrus hunters are able to repeatedly approach and harpoon walruses to deploy satellite transmitters, indicating that it is feasible to secure walruses with lines attached to harpoons before delivering a killing shot, in compliance with the regulations valid since 2006.

Seven walrus hunters from Qaanaaq were interviewed by the management authorities in 2014 (APNN 2014a). They all agreed that an estimated struck-and-loss rate of 15 % was unrealistically high, and one ventured an estimate of about 3%. The same informer mentioned that in addition there were a few cases of unreported catches.

During an interview survey conducted by GINR in 2010 in West and Northwest Greenland, experienced walrus hunters were asked specifically about the number of walruses they had landed during 2007, 2008 and 2009 and how many individuals they had lost (Born *et al.* submitted). Sixty-four of 76 interviewees responded to this question of which ca. 93% said that they do not lose any walrus; the remainder indicated that losses are few and rare.
The struck-and-loss rate estimated from the answers was 5%.

According to the legislation, it is mandatory to report any incident of struck and loss. However, reporting is extremely rare and therefore the management authorities set quotas assuming a struck and loss rate of 3% in Baffin Bay, 15% in West Greenland and 11% in East Greenland (APNN 2014b)

Aerial surveys
GINR carried out an aerial survey primarily targeting walruses in the eastern coastal part of the North Water Polynya in April 2014 (Heide-Jørgensen *et al*., submitted). Even though it did not cover all the range where walrus are found, this survey yielded a relative high number of walruses (table 1), suggesting that the population is more robust than previously assumed.

An overview of recent abundance estimates derived from aerial surveys of walrus in Greenland is presented in table 1.

Table 1. Aerial line-transect surveys of walruses in Greenland

Area/stock	Year of survey	Estimate	95 % CI	Reference
West Greenland, winter	2006	1,105	610-2,002	Heide-Jørgensen *et al.* 2013a
	2008	1,137	468-2,758	
	2012	1,408	922-2,150	
Baffin Bay (North Water polynya)	2009	1,238	856-1,791	Heide-Jørgensen *et al.* 2013b
	2010	1,759	1,008-3,070	
	2014	2,434	1,428-4,150	Heide-Jørgensen *et al.* In sub
East Greenland	2009	1,429	616 – 3,316	Born *et al*. 2009

Management and catch
Since 2006, walrus in Greenland are managed under a quota system. The current management system is described by the Executive Order nr. 20 of October 27, 2006 on the Protection and Harvest of Walrus. In addition to stock-specific quotas, limitations to hunt include:

- the protection of females and cubs in the West Greenland and East Greenland stocks (but not in Baffin Bay)
- A hunting season of 2 months from March 1 to April 30 for the West Greenland stock

- A hunting season of 9 months, from October 1 to June 30 the following year for the Baffin Bay and East Greenland stocks
- Only full time hunters are allowed to apply for a license to hunt walrus (a certified full time hunter has to be able to obtain half of his/her income from hunting and fishing)
- Licenses to hunt walrus are individual and cannot be transferred or sold
- The only vehicles allowed as transport during walrus hunting are dog sledges or marine crafts smaller than 20 BRT/15BT
- Only rifles with caliber 30.06 or larger can be used for killing walrus.
- Before giving the killing shot, the walrus should be secured with a harpoon, attached to one or more floating devices, to prevent the dead animal from sinking

The executive order includes also specifications about the reporting of catches and other aspects of walrus management.

Traditionally, walrus in Greenland are hunted either from boats in open water, from boats when the walrus are resting in ice floes or from the ice edge, by hunters on foot throwing hand harpoons attached to lines to secure the animal before shooting.

Table two gives an overview of the catches, the quotas and the advice for 2014. Previous years are not shown here, as they were covered by the report of the NAMMCO working group (NAMMCO 2013), which concluded that the stocks of walrus in Greenland were either growing (Baffin Bay and West Greenland Winter stocks) or stable (East Greenland stock, at carrying capacity).

Table 2. Estimated number of removals in Greenland and Canada, including losses, and advice in 2014. The quota for Greenland is given in parentheses. Catches from Canada are estimates based on average numbers from past catches, used by NAMMCO (2013). Estimated removals for 2014 are based on the reported catch in Greenland, plus the estimated catch in Canada and the assumed struck and loss rate. The potential removals, shown in parentheses, are the maximum number of walruses that could have been killed legally (i.e. if all the quota was taken). Information about catches was obtained from the Department of Fisheries, Hunting and Agriculture, and about quotas from APNN (2014b).

Stock	Catch GL (quota 2014)	Catch Can.	Struck & lost	Estimated removals 2014 (potential removals)	Advice	Is the catch sustainable?
West Gl. / Southern Baffin Island	52 (69)	16	15 %	78 (98)	100	Yes
Baffin Bay	67 (86)	4	2 – 5 %	73-75 (93 – 94)	93	Yes
East Greenland	8 (18)	--	11 %	9 (20)	20	Yes

Yearly quotas for the period 2014-2018 are 69 in West Greenland, 86 in Baffin Bay and 18 in East Greenland. The factual quota for Baffin Bay in 2014 was of 83, resulting from a planned quota of 86 minus 3 from an over catch in 2013; there is a carry-over system where unused catches can be transferred from one year to the next and over-catches are subtracted from the following year. Thus, legal catches in 2015 can be up to 88 walruses in West Greenland, 102 walruses in Baffin Bay and 28 in East Greenland.

Yearly walrus quotas in Greenland from 2010 – 2013 were 61 in West Greenland, 64 in Baffin Bay and 18 in East Greenland.

International trade

Walrus in Greenland are hunted for subsistence purposes. The meat is used for human consumption and the meat and hide are used to feed sledge dogs, which still are an important mean of transport during winter in West Greenland north of the Polar Circle and in East Greenland. Most of the meat is either consumed by the hunter and his social network or sold locally in the open market.

A secondary motivation for hunting walruses is the sale of walrus parts, including whole skulls, tusks (pairs in the maxilla or single), penis bones and crafted parts of walrus tusks and jaw bone. The most valuable hunting products of walrus in Greenland seen from a trade point of view are the tusks.

There is a CITES database with information about the number of items derived from walrus that are legally exported from Greenland. According to this database, there were 633 export permits issued for items derived of walrus in 2013 (CITES MA 2014). This data cannot be used to estimate the number of walruses involved in the trade, as a single walrus can provide enough material for a large number of small objects carved from the tusks.

At the moment, there is not a system in Greenland for tracking the origin of walrus products, meaning that it is not possible to record if an item on the CITES database comes from walruses from West Greenland, Baffin Bay or East Greenland.

Because we cannot quantify the importance of trade as an incentive for the hunt, the number of walruses involved on the trade, nor the origin of items, we only can issue a positive NDF if it can be documented that harvest of walruses in all Greenland is sustainable.

Conclusion

The 3 stocks of walrus in Greenland are either depleted but increasing or have reached carrying capacity and are stable (table 1), and the hunt of walrus in Greenland in 2007-2014 was sustainable (table 2). Therefore, it can be concluded that international trade does not have a negative effect in the populations of walruses in Greenland and this is a *positive NDF*.

A note of caution regarding catches from the Baffin Bay stock

The only place where there could be some reason for concern regarding the sustainability of the hunt of walrus in Greenland is in Qaanaaq, where the Baffin Bay population is hunted. Here, the quotas are at the high end compared to the advice, and uncertainties regarding the number of animals that are struck and lost, or not reported could result in a number of removals slightly higher than the biological advice (table 2). However, we still consider that a positive NDF is appropriate because of the following factors:

- The replacement yield estimated by NAMMCO (2014) is of 120 walruses (95 % CI 73- 180), meaning that a number of removals slightly higher than the advised 93 would still be likely to result in population growth

- Walrus quotas were raised in 2014, but actual catches in Qaanaaq for that year were 19 walruses below the quota
- An aerial survey in spring 2014 resulted in higher numbers than surveys in 2009 and 2010, suggesting that the stock is either growing or has been underestimated in the past, and thus is more robust than previously assumed
- The main motivation for hunting walrus in Qaanaaq is to provide food for sledge dogs and people, rather than export

It is important that the Government of Greenland keeps a keen eye on harvest levels, especially in Qaanaaq, to ensure that removals remain sustainable. Other measures that support a sound management include frequent abundance estimates, assessments and increased protection of key habitats for walrus.

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