



**REPORT
OF THE TWENTIETH MEETING
OF THE
NAMMCO SCIENTIFIC COMMITTEE
Reykjavik, Iceland, 13 – 16 November 2013**

EXECUTIVE SUMMARY
(Afsnit om hvalros ráðgiving)

Walrus

The three stocks of walrus are: in Baffin Bay estimated 1,238 in 2009 and 1,759 in 2010 (CV 0.19; 0.29), West Greenland / Baffin Island estimated 2,500 (CV 0.17) and East Greenland estimated 1,430 (CV 0.45) in 2009. Walruses tagged in spring 2010-2013 in Smith Sound, Northwest Greenland moved to Canadian waters in July and returned to Greenland in November, where they stay until spring. The tagging provided correction factors for the spring aerial surveys.

Estimates from Aerial winter surveys 2006, 2008 and 2012 in West Greenland were used as a time series of relative abundance in the assessment and an earlier time series (1981 – 1999) of walruses wintering in West Greenland to provide trend information on a longer time scale.

The WG's assessment included a low and a high catch history that includes struck and lost. This results in an average loss rate about 15% for Baffin Bay and West Greenland/Baffin Island, and about 11% for East Greenland. Complete statistics on total removal levels is critical and the SC **strongly recommended** that Greenland obtains reliable reports of all animals struck and lost. Ageing of 376 walruses caught in Qaanaaq between 1987 and 1991 was used.

The fit of the model was characteristic of selection for full-grown animals. An exponential model (Fig. 1, top) was considered to best reflect the production in the Baffin Bay population. The overall decline in the population caused by historical catches is unclear due to incomplete catch reporting prior to 1950s. The estimated decline is 63% from the 1960s to 2007, while decreased catches (~140 to ~70) have subsequently allowed this population to increase. The 2014 abundance estimated by the model was 1,430 (95% CI 999–2,170) with an annual natural growth rate of 7.7% (95% CI 6.4–9.5%) and a replacement yield in 2014 of 120 (95% CI 73–180) walruses.

The historical trajectory for West Greenland/Baffin Island walruses is unclear owing to problems in resolving long term models with current abundance data. The exponential model is unreliable here because it was unable to provide sufficient updated estimates of population growth. A density regulated model (Fig. 1, middle) initiated in 1960, however, solved the problem. It estimated a population that decreased from 4,000 (95% CI 1,210–18,600) walruses in 1960 to 2,360 (95% CI 1,720-3,280) in 2007. Annual catches were then reduced from more than one hundred to around 60, and the population was again increasing with a 2014 model estimate of 2,630 (95% CI 1,640–3,790) walruses and a replacement yield of 120 (95% CI 42–180).

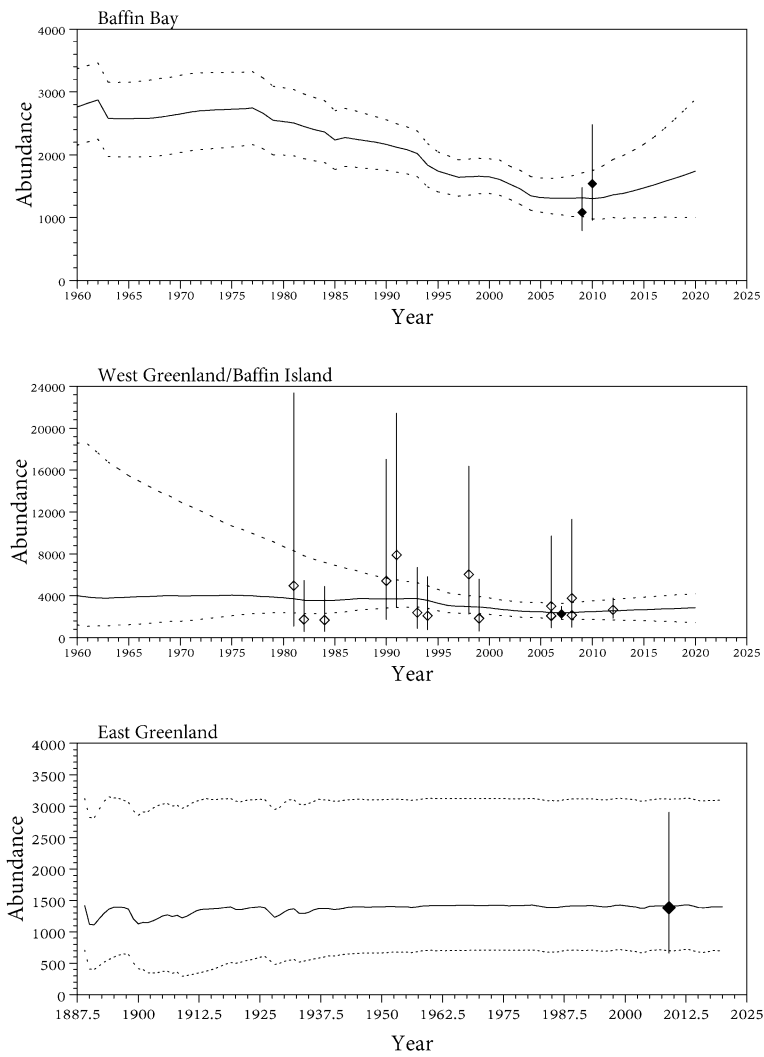


Figure 1. Projections of population models for the three walrus stocks in Greenland, together with absolute (solid diamond) and relative (open diamond) abundance estimates, with 95% confidence intervals. The solid curves are median projections, and the dashed curves span the 95% credibility interval.

Updated abundance estimates for West Greenland, and modelling with age-structured data from Baffin Bay, have improved these status estimates. The estimated trade-offs between total removals and the probability of population increase is shown in Table 1 for the Baffin Bay and the West Greenland/Baffin Island populations. A target of a 70% probability for increasing populations from 2014 to 2018 results in **recommended** total removals of no more than 93 animals from the Baffin Bay population and no more than 100 animals from the West Greenland/Baffin Island population.

Table 1. The estimated probabilities of increasing populations from 2014 to 2018 for 6 levels of annual removal from the Baffin Bay and West Greenland/Baffin Island stocks. Canadian and Greenlandic catches and struck and lost walrus are assumed to be included in removals. These removals do not assume a specific sex ratio.

Removals	75	80	85	90	95	100
Baffin Bay	0.94	0.86	0.81	0.75	0.67	0.58
West Greenland / Baffin Island	0.87	0.85	0.81	0.78	0.74	0.70

East Greenland has apparently recovered relative to 1888, the year prior to first historical catches by European sealers. The trajectory is uncertain. Density regulation estimated a relatively flat trajectory (Fig. 1, bottom), with a maximum depletion in 1890 to 80% of the initial abundance, and a slow continuous increase to almost no current growth, while selection-delayed dynamics gave a historical depletion to 3% in 1957.

There is a high ratio of males, and the overall catch is small. A run of the assessment model with the extra years of catch data shows that this is still sustainable, and the **recommendation** of an annual total removal of no more than 20 individuals from the last assessment is reiterated.

The SC discussed R-2.6.6 and concluded that there is no biological argument against carryover of unused quotas. A problem arises if carryovers accumulate over time and/or across assessments, it was deemed difficult to give more specific advice without a more specific request from the Management Committee.

In a walrus survey of Svalbard completed in 2012 an increase in both total numbers and females with calves compared with the 2006 survey is apparent. The study on disturbance at haulouts using cameras continues. Funding has been acquired for a 2014 tagging project that aims to investigate how individuals are responding to changes in ice conditions.