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DOCUMENT 18	**CLARIFICATIONS FROM THE SC ON PRINCIPLES FOR THE INCORPORATION OF A PRECAUTIONARY APPROACH TO STOCK MANAGEMENT IN NAMMCO**
Submitted by	Scientific Committee (SC)
Action requested	To take note
Background/content	At the meeting of the Joint Management Committees (MCJ, 1st of March 2023), the Parties were presented with 8 principles agreed by the SC for a precautionary approach in the management of cetacean and pinniped stocks within the remit of NAMMCO. Greenland requested the SC to provide clarifications on principles 2, 3, 4 and 7 before an endorsement could be made. This document contains responses from the SC to Greenland's concerns on principles 2, 3, 4 and 7.

1. CLARIFICATION ON THE PROPOSED PRINCIPLES FOR THE INCORPORATION OF A PRECAUTIONARY APPROACH TO STOCK MANAGEMENT IN NAMMCO

1.1 BACKGROUND

A request for advice from the Scientific Committee (SC) regarding the incorporation of a precautionary approach to the management of marine mammal stocks within the remit of NAMMCO was formulated at Council meeting 27 (2021) and numbered as request 1.6.7.

***R-1.6.7 (ongoing)**: To explain how and at what level the precautionary approach is, or can be, integrated into advice provided by the SC for use in conservation and management, with a particular focus on depleted stocks.*

To support its work, the Joint NAMMCO-JCNB Working Group (JWG) on narwhal and beluga in 2021, also requested the SC that "definitions be developed for what constitutes small stocks, depleted stocks and stocks at risk of extirpation, and that frameworks for advice and management then be articulated for what actions should be taken for these different categories."

The SC was further asked by the Heads of Delegation (HoDs) to answer the following two questions:

- Advice on how to prioritize the assessment of marine mammal species.
- Provide advice on whether NAMMCO needs within a precautionary framework some rules on regularity of surveys, assessments, etc.

1.1.1 SC meeting

At its 29th meeting (23-25 January 2023) the SC **recommended**:

That the eight principles listed below be used for the incorporation of a precautionary approach to stock management in NAMMCO (see box 1).

That the three criteria below, without any order of priority, be used for prioritising the assessment of the stocks within the remit of NAMMCO:

- *Stocks with concerning population status.*
- *Stocks for which no assessment has been conducted.*
- *Assessments of each stock should be conducted at a minimum every 5-10 years, or more frequently if there is concern on the population status.*

1.1.2 Meeting of the Management Committees

At the meeting of the Joint Management Committees (MCJ, 1st of March 2023), the Parties were presented with the 8 principles and the 3 criteria agreed by the SC for a precautionary management and prioritization of assessments of marine mammal stocks in NAMMCO, respectively. The MCJ reached consensus on forwarding the 3 prioritization criteria, but regarding the 8 principles, Greenland requested the SC to provide clarifications on principles 2, 3, 4 and 7 before an endorsement could be made.

Box 1. List of principles for integrating a precautionary approach in NAMMCO's management of cetaceans and pinniped stocks. The principles for which Greenland requested clarification from the Scientific Committee are highlighted.

1)	Anthropogenic removals of marine mammals should be assessed for sustainability.
2)	Sustainable management actions should be to maintain or restore stocks at levels ideally above 60% of their equilibrium in the absence of anthropogenic removals, disturbance and resource competition.
3)	Stocks that are depleted below 60% should be managed to increase so that they can recover to the 60% level in a reasonable time period. For example, by having total removals that ensure at least a 70% probability of increase.
4)	Stocks that are small (<1000 individuals, unless there are more than 400 reproductive age females in the population) should be fully protected from exploitation unless a data-based assessment is able to recommend a sustainable hunt.
5)	Management decisions should be based on the best available science, which may include hunter and user data and observations.
6)	Where the best available science is insufficient the precautionary approach shall be widely applied, particularly for small stocks. With greater uncertainty more caution is required.
7)	Acknowledging that halting all hunting of a stock may not be sufficient to promote recovery of a depleted or small stock, additional management actions should be considered.
8)	All species assessments should include data requirements for future assessments.

1.2 RESPONSE FROM THE SCIENTIFIC COMMITTEE (SC) TO CONCERNS FROM GREENLAND ON PRINCIPLES 2, 3, 4 AND 7.

This letter addresses the concerns raised by Greenland in relation to 4 of the 8 principles for a precautionary management of marine mammal stocks in NAMMCO recommended by the SC.

As noted by Greenland, some of the proposed principles will to some degree be species specific. Because of this, and because of the different approaches to management advice across the range of marine mammals covered by NAMMCO (from management procedures for large whales, over assessments from ICES, assessments in cooperation with JCNB, and purely internal NAMMCO assessments), **the principles were developed as "general rules to follow" more than "very specific rules of what to do"**. This is important to keep in mind when interpretating the principles.

Below the Scientific Committee addresses the specific concerns raised by Greenland.

Comment from Greenland:

*1) With regard to **principles 2 and 3**, … how will the stock 'equilibrium in the absence of anthropogenic removals, disturbance and resource competition' be defined.*

Answer from SC:

The equilibrium abundance is a parameter in the assessment models that is estimated by the model based on the available abundance data (e.g., from count surveys). Despite a stock assessment can be produced without estimating the equilibrium abundance, the SC recommends including this parameter in all assessments, so the best management advice can be delivered. For example, the depletion level that is often reported in assessments, is the current abundance divided by the equilibrium abundance.

Two complicating factors relate to anthropogenic disturbance and anthropogenic resource competition. These factors are usually not accounted for in the assessment models, and their influence on the equilibrium abundance is in most cases unknown. The reference equilibrium of assessments usually includes the effects of disturbance and anthropogenic competition, instead of excluding them as implied by principle 2. The statement is however softened to "ideally above 60%" which accommodates the addition of the anthropogenic factors.

Comment from Greenland:

*2) With regard to **principles 2 and 3**, Greenland also seek clarification why 60% is used as a reference point for at which level should stocks be restored, when 70% is used by the ICES/NAFO/NAMMCO WGHARP, and also used in relation to narwhal and beluga. Clarification is needed on what this 60% has been chosen. Greenland noted that for instance Norway is using a tuning level of 62% for minke whale, while the tuning of the IWC is 72%.*

Answer from SC:

Some of these percentages do not relate to the same thing. For example, the 70% in narwhal and beluga assessments relates to the probability of increase in a depleted stock, while the 60% here relates to the depletion level.

The depletion level of 60% is somewhat arbitrarily chosen, but it corresponds to a maximum sustainable yield level (MSYL) at 60% depletion as often used in assessment models of marine mammals. The MSYL is the abundance at which a population produces the largest annual surplus of animals that can be removed without causing the subpopulation to decline and is usually assumed to be somewhere between 60 – 70 % of the equilibrium size in the absence of removals. The SC however wanted to avoid the use of terms like maximum sustainable yield (MSY), because they are model dependent and not always the best options. The SC decided therefore to use a broader concept of defining the target depletion in relation to the equilibrium abundance. A target of 'above 60%' is not in opposition to a stronger target of being above 70% (as in ICES/NAFO/NAMMCO/WGHARP).

Comment from Greenland:

*3) Regarding **principle 4**, Greenland would like to ask the SC to explain where these two numbers come from; i.e., where does the SC definition of a small population comes from: ' <1000 individuals, unless there are more than 400 reproductive aged females in the population'. The reason to choose these numbers should be explained by the SC, as Greenland sees them very important, and so clarification is needed before principle 4 can be recommended for endorsement. In the understanding of Greenland, such definition is dependent on the species concerned, i.e., reproductive rate, survival, etc.*

Answer from SC:
The two numbers refer to the same thing if the sex ratio in the population is even, but if you have a population that is smaller than 1000 individuals with more than 400 mature females then the principle does not apply.

As with the 60% depletion, the 1000 individuals, is a somewhat arbitrary threshold that reflects different issues. As mentioned in the comment by Greenland, hunting on a small population may be possible for some species in specific situations. This possibility is acknowledged in principle 4, which states that full protection is not needed if a data-based assessment is able to recommend a sustainable hunt. In other words, if the hunt is well controlled, monitoring is sufficient and assessment is available, it is possible to have a demonstrably sustainable hunt on a smaller population. If the hunt is open to many hunters over a large area, monitored seldom and even subject to unknown losses then the uncertainty associated with the catches are much larger than in the controlled hunt. The risk of extirpation is larger for smaller populations, therefore principle 4 states that there needs to be a minimum number below which it is required to have a data-based assessment before allowing any

catches. Some may argue that the hunt should in all cases be zero unless you have an assessment that recommends a hunt. Yet, the SC finds that this position is too strong in relation to many of the hunts in NAMMCO countries. Examples are the hunt of ringed and bearded seal, where there are still insufficient data for assessment-based recommendations, but it is assumed that populations are large enough to sustain harvest.

As we are dealing with **general principles**, the SC decided to aim for a **single threshold number** that was large enough to reflect a combination of concerns about the uncertainties surrounding the abundance, the potential hunt, and the biological details of the species. As there is no simple way to quantify the uncertainty across the many marine mammals and hunts in NAMMCO, the SC agreed that the **threshold number of 1000** is appropriate. It is important to have a threshold because there are examples of populations with low numbers that have not substantially recovered from overharvest, despite decades of protection (see Table 1). As with the other principles, this number is a **general rule**, and the SC decided not to specify the number in relation to specific values of the abundance estimates.

Table 1. examples of populations of marine mammals that number less than 1,000 individuals and show no clear signs of recovery, despite decades of protection from harvest. For some population size values, the Coefficient of Variation (CV) and 95% Confidence Interval (CI) of the estimates are given.

Species	**Location**	**Population size**	**Year of estimate**	**Reference**
Beluga	St Lawrence River	889	2015	Mosnier et al. 2015[1]
Beluga	Cook Inlet	328 (CV 0.08)	2016	Shelden et al. 2017[2]
Beluga	Svalbard	549 (CI: 436–723)	2018	Vacquie-Garcia et al. 2020[3]
Killer whale	Puget Sound	73	2019	Clarke Murray et al 2021[4]
Harbour seal	West Greenland	<1000 < 200 seals in known locations	2007 2020	Rosing-Asvid 2010[5] Rosing-Asvid 2020[6]
North Atlantic Right whale	Off Eastern North America	<410	2017	Christiansen et al. 2020[7]
Grey whale	East Russia	243	2014	Bröker et al. 2020[8]

Comment from Greenland:

*4) Regarding **principle 7**, Greenland considers the content of this principle as very wide, not very clear, and not telling which other management actions could be on the table. However, Greenland does not see principle 7 as a binding recommendation. Therefore, Greenland would also like the SC to further provide clarifications on this principle."*

Answer from SC:

The principles **are general and not case specific**, and the main point of principle 7 is to remind managers to consider other management options than direct hunt regulation. This could e.g. be that seal hunting in Greenland close to a colony of the protected harbour seal could cause high mortality of harbour seals, because of mistaken species identification. A hunting ban in the area might mitigate the problem. Another example is by-catch that is believed to be the cause behind some declining stocks of grey seals and harbour porpoises. It may thus be necessary to reduce by-catch.

Additional management actions that can promote recovery of small or depleted stocks are, for example, to reduce anthropogenic impacts due to disturbance (e.g. tourism) and habitat destruction.

[1] Mosnier A, et al. (2010) Information relevant to the documentation of habitat use by St. Lawrence beluga (*Delphinapterus leucas*), and quantification of habitat quality. DFO Can. Sci. Advis. Sec., Res. Doc. 2009/098. iv + 35 p. Available at http://www.dfo-mpo.gc.ca/csas

[2] Shelden KEW,et al. (2017) Aerial surveys of beluga whales (*Delphinapterus leucas*) in Cook Inlet, Alaska, June 2016. AFSC Processed Rep. 2017-09, 62 p. Alaska Fish. Sci. Cent., NOAA, Natl. Mar. Fish. Serv., 7600 Sand Point Way NE, Seattle WA 98115. Available online: http://www.afsc.noaa.gov/Publications/ProcRpt/PR2017-09.pdf

[3] Vacquié-Garcia J,et al. (2020) First abundance estimate for white whales (*Delphinapterus leucas*) in Svalbard, Norway. Endangered Species Research 41 , 253–263,

[4] Clarke Murray C,et al. (2021) A cumulative effects model for population trajectories of resident killer whales in the Northeast Pacific. Biological Conservation. 257. 109124. 10.1016/j.biocon.2021.109124.

[5] Rosing-Asvid A (2010) Catch history and status of the harbour seal (*Phoca vitulina*) in Greenland. NAMMCO Scientific Publications, 8, 161-174. https://doi.org/10.7557/3.2683

[6] Rosing-Asvid A (2020) Status of harbour seals in Greenland 2020. Working paper. NAMMCO Working Group on Coastal Seals, Copenhagen.

[7] Christiansen, F., et al. (2020). Population comparison of right whale body condition reveals poor state of the North Atlantic right whale. Marine Ecology Progress Series, 640, 1–16. https://doi.org/10.3354/meps13299

[8] Bröker, K. C. A.,et al. (2020). Site-fidelity and spatial movements of western North Pacific gray whales on their summer range off Sakhalin, Russia. PLOS ONE, 15(8), e0236649. https://doi.org/10.1371/journal.pone.0236649