NAMMCO ANNUAL MEETING 31

19–21 March 2024
Hotel Reykjavík Grand, Reykjavík, Iceland

MEETING OF THE COUNCIL

DOCUMENT 08	**REPORT OF THE SCIENTIFIC COMMITTEE**
Submitted by	Scientific Committee (SC)
Action requested	**Management Committees:** - Determine whether to endorse new proposals for conservation and management, and recommendations for research, and to forward these to the Member Countries. - Respond to the SC's requests for guidance. - Consider the proposed long-term assessment plan. **Council:** - Consider the proposed workplan. - Consider the SC's requests and proposals for funding schemes. - Consider the concerns of the SC pertaining to the situation of narwhal and beluga in Southeast Greenland.
Background/content	The SC held its 30th meeting at the Marine and Freshwater Institute in Hafnarfjörður (Iceland) on January 22–26, 2024. This report does not include the Working Group and Workshop reports, which were made available, per the rules of procedure, on the NAMMCO website following the completion of the meetings (https://nammco.no/scientific-working-group-reports/).

30TH MEETING OF THE NAMMCO SCIENTIFIC COMMITTEE

January 22 – 26, 2024
Marine & Freshwater Research Institute, Hafnarfjörður, Iceland

REPORT

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NAMMCO

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EXECUTIVE SUMMARY

The 30th meeting of the NAMMCO Scientific Committee (SC) was held at the Marine and Freshwater Institute in Hafnarfjörður (Iceland) on January 22–26, 2024. The meeting was chaired by Aqqalu Rosing-Asvid (Greenland), with assistance from vice-Chair, Sandra Granquist (Iceland), and was observed by representatives of Canada (online) and Japan.

The meeting Agenda is available in Appendix 1. The list of meeting participants, documents made available to the meeting, and all recommendations made by SC/30 are available in Appendices 2, 3, and 7, respectively.

Updates from Observers (Item 4)

Observers from Japan presented research activities on large and small cetaceans for the period 2021–2023, as well as recent telemetry studies.

Updates from Council (Item 5)

Decisions and requests made by NAMMCO Council 30 were summarised, including changes in the status of previous requests (Appendix 4) and proposals for Research, Conservation, and Management that were forwarded to the four Parties (Appendix 5). The SC noted that, once again, the Management Committee for Cetaceans was unable to reach consensus on the recommendation for zero removals of narwhals in East Greenland.

The SC was also informed of the Terms of Reference (ToRs) of the recently established Working Group on Enhancing User Involvement in NAMMCO Decision Making (UIWG) and presented with examples of incorporating user knowledge in a scientific advisory process. Logistical and financial challenges to such endeavours were noted. The SC welcomed sources of knowledge that can improve stock assessments, citing the case of narwhals in East Greenland as a pertinent example in which hunters' knowledge and assistance is already incorporated in data collection.

Interaction with other organisations (Item 6)

Updates were provided on NAMMCO interactions with the Arctic Council, ASCOBANS, ICES, OSPAR, and the Ostrobothnian Fisheries Association.

Collaborative projects (Item 7)

MINTAG Project: Extensive testing of different tag designs for minke and fin whales was conducted in Japan, Denmark, the Faroe Islands, and Iceland. Tags were also deployed in the field, in Japan, Greenland, and Norway, with tag retention being the primary issue observed. Two modified designs—with the aim of improving retention rates—of the minke whale tag will be field tested during 2024. The SC approved the Steering Group's (StG) plans for continued experimental deployments, *highlighting* that optimal tagging platforms must be put in place.

GUARDNA Project**:** As part of NAMMCO's Educational Programme, GUARDNA is a three-year initiative aiming to educate and empower North Atlantic youth on themes of ocean conservation and sustainability. As well as general information on marine mammals, their users, and threats, activities of MINTAG and NASS 2024 will be used to engage students in high-profile research.

Collaboration with Japan: A collaborative project is being conducted by Japanese and Norwegian researchers, aiming to understand the foraging ecology of the North Pacific common minke whale. Sightings, catch, and environmental data are being used to determine the driving factors of annual changes in minke whale distribution and prey types. Results will be compared to similar analyses previously conducted for the North Atlantic common minke whale.

The SC *proposed* the establishment of a joint travel fund to facilitate this and other collaborations between Japanese and NAMMCO scientists.

Environmental and Ecosystem Issues (Item 8)

Marine Mammal/Fisheries Interactions

The Working Group on By-Catch (BYCWG) aims to identify areas where marine mammals are likely to be highly exposed to the risk of by-catch, based on the overlap of species distribution and fishing effort. This will determine where by-catch monitoring efforts should be concentrated. To collect the necessary fishery data for this analysis, the BYCWG is formulating a data call to the Parties. Some preliminary information was requested from the Fisheries Departments of each country, but Iceland has yet to answer. The SC *recommended* that Iceland provide an answer as soon as possible, allowing the BYCWG to proceed with the formal data call.

Multi-species Approaches to Management and Modelling

The SC *agreed* to update the list of different multi-species ecosystem modelling projects that members are involved in, as well as provide information on the reliability of such models, for the next SC meeting.

Environmental Issues

The SC *recommended* that the Joint NAMMCO-JCNB Working Group provide further monitoring updates of the Mary River Project and associated disturbances to marine mammals at its next meeting.

Seals and Walrus Stocks (Item 9)

Bearded Seal: The NAMMCO Panarctic Bearded Seal Workshop was held online in March 2023, to assess the status and trends of the species throughout its range and identify threats and critical knowledge gaps. The SC recognised the difficulty in obtaining accurate abundance estimates of the species and that there are insufficient data available to conduct a robust assessment. The Bearded Seal Working Group meeting originally planned for 2024 will, as a result, be postponed. The SC *endorsed the recommendations* of the Workshop and prioritised three (Box 1).

Box 1. Recommendations pertaining to Bearded Seals prioritised by SC/30.

Recommendations for Research to Greenland

- To analyse survey data that included bearded seal sightings in Greenland.
- To obtain tracking data from bearded seals tagged in Greenland and East Baffin Island to get information on stock structure.
- To determine a suitable availability correction factor.

Ringed Seal: The Ringed Seal Working Group met online in November 2023, with the aim of reviewing available data, delineating management areas, and conducting stock assessments if possible. Broad management areas were suggested based on telemetry data, namely Svalbard, East Greenland, and West Greenland–East Canada, but there might be finer-scale stock structure within these regions. Such is the case of the Kangia fjord seals, which are genetically and geographically distinct from other stocks, and should be treated as a separate ecotype. There were insufficient abundance estimates available to conduct stock assessments, but it is likely that changes in sea ice conditions will heavily impact this species. The SC *endorsed the recommendations* of the Working Group and prioritised seven (Box 2).

Box 2. Recommendations pertaining to Ringed Seals prioritised by SC/30 (continued on next page).

Recommendations for Research to All Parties

- To use genetic and telemetry data only from adult ringed seals or nursing pups sampled during the breeding season for population structure studies.
- To monitor the effects of climate change to understand the drivers potentially impacting ringed seals with a focus on sea ice conditions, to ensure an up-to-date assessment of the ringed seal habitat status.
- To conduct partial surveys of ringed seals (as index).
- To ensure that efforts to determine population structure be continued.

Box 2. Recommendations pertaining to Ringed Seals prioritised by SC/30 (continued from previous page).

Recommendations for Research to Greenland

- To carry out a new survey of the Kangia seals in spring 2024 to get a new abundance estimate and report this to the next SC meeting.
- To monitor selected fjord systems with and without catches to assess the effects of hunting, disturbance, and climate change.

Recommendations for Conservation & Management to Greenland

- To validate catch numbers.

Harbour and Grey Seals: The Coastal Seals Working Group met in May 2023, with the aim of assessing harbour and grey seal stocks across the North Atlantic. Preliminary results from genetic and tracking studies suggest that the current harbour seal Management Areas in Norway should be redefined. In Iceland, the harbour seal population has experienced a threefold decline since 1980. Various management measures have been put in place in an effort to maintain the population above 12,000 animals. The main mortality risk is by-catch, and tourism is a growing source of disturbance to harbour seals in Iceland. In Greenland, harbour seals only occur in a few small populations and hunting thereof has been banned since 2010. However, some animals are still shot accidentally or taken as by-catch in gillnets. Some grey seal populations in Norway have experienced a severe decline in recent years, likely due to by-catch in the monkfish fishery, while others remain stable or increasing. Grey seal numbers have also declined in Iceland over the past decades, while in the Faroe Islands they are expected to increase following the 2021 ban on harvesting. The SC *endorsed the recommendations* of the WG and prioritised two (Box 3).

Box 3. Recommendations pertaining to Coastal Seals prioritised by SC/30.

Recommendations for Research to All Parties

- To estimate sustainable removal levels for each stock of grey and harbour seals.

Recommendations for Research to Iceland

- To continue efforts to develop population models for both species, assess whether data on biological parameters (e.g., historical population size, changes in carrying capacity over time) from other areas can be used for this, and collect data on biological parameters from Icelandic seals to the extent that it is necessary.

Harp and Hooded Seals: A Benchmark Workshop for Harp and Hooded Seals was held in May 2023, with the goal of evaluating proposed developments to the assessment models currently used for these species. Following this, the Joint Working Group on Harp and Hooded Seals met in August 2023, to review recent survey and life history data and examine harvest scenarios. However, the assessment models proved highly sensitive to prior assumptions and could not be used to explore harvest

Box 4. Recommendations pertaining to Harp and Hooded Seals prioritised by SC/30.

Recommendations for Research to Norway

- To tag more harp and hooded seals in the Greenland Sea and the Denmark Strait, and to reanalyse satellite tagging data from the past for both species.
- To investigate changes in body conditions of both harp and hooded seals in relation to fishing activity.
- To develop a composite environmental index, including physical and ecosystem parameters.

scenarios. The SC *endorsed the recommendations* of the WG, prioritised three (Box 4), and *agreed* that the reasons behind the apparent decline in hooded seals in the Greenland Sea remain unclear and should be verified with data.

Walrus: The planned Walrus Working Group meeting is postponed until 2026, at which time the analysis of new and existing survey data from Greenland will have been completed. Survey results and catch data will also be requested from Canada, to complement the information needed for a robust stock assessment.

Cetacean Stocks (Item 10)

Narwhal: The Ad hoc Working Group on Narwhal in East Greenland (NEGWG) met in December 2023. Fine-scale genetic structure analysis revealed that the spring and summer hunts in Scoresby Sound are supplied by different aggregations. All recent aerial surveys in Southeast Greenland, including one designed and conducted with the direct participation of local hunters, indicate a continued decline of narwhals in all three Management Areas. Assessment models for each area point to an immediate risk of stock extirpation at current quota levels. The SC *endorsed the recommendations* of the WG and highlighted one (Box 5). The WG further proposed definitions for Monodontid stock status and congruent Management Frameworks for each. The SC *approved* these frameworks, which are available in Appendix 6 of this report.

Box 5. Recommendations pertaining to Narwhal prioritised by SC/30.

Recommendations for Conservation & Management to Greenland

- For all three Management Areas, the SC ***strongly reiterates*** the recommendation for zero removals and immediate closure of the hunt.

Beluga: The NEGWG reviewed the latest information on genetics and catches of belugas in East Greenland. While still irregular, increased catches since 2017 indicate more frequent occurrence of belugas in the region in recent years. Genetic analyses revealed that these animals originate from at least three different circumpolar stocks, including the Beaufort Sea (USA and Canada), Kara Sea (Russia), and Svalbard (Norway). The SC *endorsed the recommendations* of the WG and prioritised two (Box 6).

Box 6. Recommendations pertaining to Belugas in East Greenland prioritised by SC/30.

Recommendations for Research to Greenland

- Collect incidental observations and biological samples when available, to monitor the occurrence of belugas in East Greenland.

Recommendations pertaining to Sustainable Removals in Greenland

- Zero removals should be allowed, in order to allow for the potential establishment of a new population of belugas in East Greenland, and to avoid removing animals that have potentially originated from the small and protected Svalbard stock.

Harbour Porpoise: The SC considers the assessment of harbour porpoises in Iceland to be of high priority and *recommended* that suitable data on biological parameters be collected. No abundance estimate will be available for this stock until 2026 at the earliest, therefore the SC *concluded* that an assessment for all countries could potentially be undertaken that year.

Dolphins: The Working Group on Dolphins met for the first time in October–November 2023 to assess the status of white-beaked and white-sided dolphins in the NAMMCO area. Based on genetic and telemetry data, white-sided dolphins were assessed as a single unit. A conservative assessment model including abundance, life history, and catch data indicated that removals of up to 750 white-sided dolphins per year across the Faroe Islands, Greenland, and Iceland maintained a 70% likelihood of sustainable catches. For white-beaked dolphins, although there is genetic evidence of at least three distinct stocks, there were considerable uncertainties regarding misreporting and struck and lost animals in catch data. Not being possible to conduct a full assessment, a preliminary assessment using the Potential Biological Removal approach was done, which indicated that catches of this species in Greenland may be unsustainable. The SC *endorsed the recommendations* of the WG and prioritised four (Box 7).

Box 7. Recommendations pertaining to *Lagenorhynchus* dolphins, prioritised by SC/30.

Recommendations for Conservation & Management to Greenland

- To validate the Greenlandic removals with a special focus on minimising underreporting and estimating struck and lost rates, thus facilitating a full assessment of white-beaked dolphins as soon as possible *(high priority)*.

Recommendations for Conservation & Management to the Faroe Islands

- To validate the completeness of the Faroese white-sided dolphin catches, focusing on the apparent lack of juveniles in the catch.

Recommendations pertaining to Sustainable Removals

- To maintain *total removals* below 750 white-sided dolphins per year across Greenland, Iceland, and the Faroe Islands.

Recommendations for Research to Greenland

- To determine the stock identity of white-beaked dolphins in West Greenland, using increased genetic sampling and tagging efforts in Greenland.

Pilot Whale: In advance of the planned assessment in 2025, progress is being made on the analysis of biological samples for age and reproductive data, as well as in tracking studies of pilot whales in the Faroe Islands. The SC *recommended* that the Working Group on Genetics provide guidance on the most appropriate analysis and interpretation of genetic data.

Northern Bottlenose Whale: The SC noted that reports of this species in Greenlandic catch data should be validated.

Research updates were also presented on **Beaked Whales**, **Blue Whale**, **Bowhead Whale**, **Common Minke Whale**, **Fin Whale**, **Humpback Whale**, **Killer Whale**, **Sei Whale**, and **Sperm Whale**.

Management Procedures (Item 11)

Stock categorisation system: Council 30 requested the SC to propose a system for categorising NAMMCO stocks, which would reflect the abundance, status of knowledge, and levels of removals of each. The SC *requested clarification* as to the need for such a system, given NAMMCO's existing approach to conducting species assessments.

Long-term assessment plan: Following a request from Council 30, and based on the recommended assessment frequency for each species, the SC proposed a long-term plan for the assessment of NAMMCO stocks currently undergoing significant removals.

NASS 2024 Planning (Item 12)

The upcoming survey in the summer of 2024 will make use of both dedicated and opportunistic (Norwegian, Faroese, and Icelandic mackerel survey, Icelandic redfish survey) platforms to cover all important areas for the target species of each country. Stratification for the entire NASS area has been designed, pending the finalisation of the redfish survey stratum. The Scientific Planning Committee (SpC) will finalise transect design in February 2024, while survey and observer training protocols will be finalised in May 2024.

Work Procedures (Item 13)

Working Group on Genetics: To improve the reliability of stock structure information and hypotheses used in assessments, SC/29 had suggested the formation of a technical Working Group on Genetics. Relevant experts in marine mammal genetics were invited to the first meeting of this group in October 2023, where the ToRs were drafted and potential workflows were discussed. SC/30 endorsed the ToRs and *recommended* that the first tasks of the WG should be to examine information on stock structure/genetic connectivity of pilot whales, narwhals, and belugas.

Future meetings: The SC supported a suggestion to invite more mid- and early-career scientists as external experts and (vice-) Chairs to meetings of subsidiary bodies, ensuring a smooth generational turnover within NAMMCO. The SC *proposed* that NAMMCO provide separate funds to facilitate such an initiative.

NAMMCO Website (Item 14)

The SC will review and revise the information provided on the NAMMCO website for bearded seal, ringed seal, white-beaked dolphin, and Atlantic white-sided dolphin by March 1, 2024.

NAMMCO Scientific Publications (Item 15)

Volume 13 “Marine Mammals in the North Atlantic: Part II” will be published in 2024, as the research articles submitted are still undergoing review. The next volume will focus on the topic of “Anthropogenic Impacts on Marine Mammals”.

Future Workplans and Budget (Items 16–17)

The SC proposed the following revised workplan, in line with the long-term assessment plan, and drafted revisions to the budget for 2024 and 2025 accordingly.

2024	2025	2026
WG and WS meetings: - WG on By-Catch - Genetics WG	**WG and WS meetings:** - Large Whale Assessment WG - Pilot Whale WG - Abundance Estimate WG - WG on Harp and Hooded Seals - JWG NAMMCO-JCNB	**WG and WS meetings:** - Harbour porpoise WG - Coastal Seals WG - Walrus WG - Narwhal in East Greenland WG (pending MCC decision) - Abundance Estimate WG
Other meetings and activities: - NASS 2024 SpC: meetings online & in person - MINTAG StG: online meetings - MINTAG: deployment field work and analysis - NASS 2024 surveys	**Other meetings and activities:** - MINTAG StG: online meetings - MINTAG: deployment field work and analysis	**Other meetings and activities:** - MINTAG StG: online meetings - MINTAG: deployment field work and analysis

The 31st SC meeting will be held on January 20–24, 2025, and will be hosted by Norway. The precise location will be determined at a later time.

Other Business (Item 18)

Given increasing public interest and growing pressures on marine mammals from the industrial and touristic shipping activity, the Secretariat questioned whether related disturbances should be assessed in a more targeted fashion by the SC. The SC noted that all stock assessment Working Groups are asked to consider anthropogenic threats besides removals, and that these include disturbance from vessels and recreational activities.

Report Review & Meeting Close (Items 19–20)

A draft report of SC/30 was approved during the meeting and, following minor revisions by correspondence, the final report was accepted on February 9. The meeting ended at 15:25 CET on January 26, 2024.

MAIN REPORT

The 30th meeting of the NAMMCO Scientific Committee (SC) was held at the Marine and Freshwater Institute in Hafnarfjörður (Iceland) on January 22–26, 2024. The meeting was chaired by Aqqalu Rosing-Asvid (Greenland), with assistance from vice-Chair Sandra Granquist (Iceland), and was observed by representatives of Canada (online) and Japan. The meeting agenda and list of participants and observers are available in Appendix 1 and 2, respectively.

1. WELCOME FROM THE CHAIR AND OPENING REMARKS

The Director of the MFRI, Þorsteinn Sigurðsson, welcomed the meeting participants to Hafnarfjörður and to the new buildings of the Institute.

The Chair of the SC, Rosing-Asvid, welcomed participants and observers to the 30th meeting of the Committee. A particularly warm welcome was extended to the observers from Japan, acknowledging the long-standing relationship between NAMMCO Countries and Japan and highlighting collaborations across several scientific projects. The Chair introduced the two new members of the SC, Sascha Schiøtt (Greenland) and Ulf Lindstrøm (Norway), as well as Maria Garagouni and Naima El bani Altuna, the new NAMMCO Deputy Secretaries.

2. ADOPTION OF AGENDA

The draft agenda was delivered to the committee 30 days prior to the meeting, as per the Rules of Procedure. The agenda (Appendix 1) was adopted without further amendments.

3. APPOINTMENT OF RAPPORTEURS

Garagouni was appointed primary rapporteur for the meeting, with the assistance of the other members of the Secretariat (El bani Altuna and General Secretary, Geneviève Desportes). All participants were asked to submit written summaries of presentations and interventions on agenda items as relevant.

4. REVIEW OF AVAILABLE DOCUMENTS AND REPORTS

4.1. NATIONAL AND ANNUAL PROGRESS REPORTS

The Chair noted that National Progress Reports for 2022 from each of the Member countries, as well as Japan and Makivvik Corporation, had been submitted as For Information documents.

4.1.1. Updates from observers

The updates from Japan consisted of three progress reports: NAMMCO/SC/30/FI06 on small cetaceans, NAMMCO/SC/30/FI07 on large cetaceans (presented by Taro Sugimoto), and NAMMCO/SC/30/FI29 on recent telemetry studies (presented by Kenji Konishi), as well as NAMMCO/SC/30/24 on the collaborative research being conducted on common minke whales. This latter document was discussed under item 7.3.

Summary

Documents FI06 and FI07 summarised the following Japanese research projects/activities on cetaceans conducted in the period 2021–2023: 1) collection of biological samples and data from commercial whaling on common minke, Bryde's, and sei whales in Japan's Exclusive Economic Zone (EEZ), and from fisheries of small cetaceans. These samples and data are being analysed in contribution to the stock assessment and management of large and small cetaceans in the western North Pacific; 2) dedicated sighting surveys for large and small cetaceans under the programs Japanese Abundance and Stock structure Surveys in the Antarctic (JASS-A) in the Southern Ocean, International Whaling Commission-

Pacific Ocean Whale and Ecosystem Research (IWC-POWER) in the North Pacific (mainly in the central North Pacific), and six national sighting survey programs in the North Pacific Ocean. These programs primarily involved sighting surveys for abundance estimates. Additionally, oceanographic, marine debris, photo-identification, biopsy sampling and satellite tagging for large and small whale species were conducted during the surveys; 3) DNA register and molecular monitoring in the retail market for large whales; and 4) records and analyses (mainly on population genetic structure) of by-catches and stranding including large and small cetaceans. Several research institutes and universities participated or contributed to the research in each project. The biological samples and data collected using both lethal and non-lethal techniques in the period mentioned above are being used in analyses relevant to the research objectives of each research project/activity. A total of 11 scientific documents for large cetaceans and their environment were published in peer-reviewed journals in 2023, while one paper was published on small cetaceans in 2021–2022.

4.2. WORKING GROUP REPORTS

The reports of seven Working Group (WG) meetings held in 2023 were available for review by the SC:

- Working Group on By-Catch (NAMMCO/SC/30/05)
- Working Group on Coastal Seals (NAMMCO/SC/30/06)
- Working Group on Dolphins (NAMMCO/SC/30/07)
- Working Group on Ringed Seals (NAMMCO/SC/30/08)
- Technical Working Group on Genetics (NAMMCO/SC/30/09)
- *Ad hoc* Working Group on Narwhal in East Greenland (NAMMCO/SC/30/10)
- Joint Working Group on Harp and Hooded Seals (NAMMCO/SC/30/11)

4.3. OTHER REPORTS AND DOCUMENTS

Reports from two workshops held in 2023, the NAMMCO Panarctic Bearded Seal Workshop and the ICES/NAFO/NAMMCO Benchmark Harp & Hooded Seal Workshop, were made available as documents NAMMCO/SC/30/12 and NAMMCO/SC/30/13 respectively, as were the reports and minutes of meetings held by the MINTAG Steering Group (NAMMCO/SC/30/15 and NAMMCO/SC/30/FI32) and the NASS 2024 Scientific Planning Committee (NAMMCO/SC/30/14).

A full list of submitted documents can be found in Appendix 3.

5. UPDATES FROM COUNCIL

5.1. GENERAL COMMENTS

Desportes provided an overview of decisions and recommendations from the Management Committees (Management Committee for Cetaceans, MCC; Management Committee for Seals and Walrus, MCSW; and the Joint meeting of the Management Committees, MCJ) and the Council meetings held in 2023 of direct relevance to the SC.

The MCs reached consensus for forwarding to the Parties several proposals for Conservation and Management recommended by SC/29, related to environmental issues and mitigation of disturbances (Greenland), beluga and narwhal (Greenland), killer whale (Greenland), and harbour porpoise (Norway).

In particular, the MCC noted that the by-catch of harbour porpoises was deemed unsustainable, and Norway was advised to continue its efforts to reduce the by-catch of harbour porpoises.

The full list of proposals forwarded to the Parties (NAMMCO/SC/30/FI08) is available in Appendix 5 of this report.

The Management Committees (MCs) examined at their 2023 meeting a single new recommendation for conservation and management directly related to sustainable catches and pertaining to narwhal in West Greenland. A consensus could not be reached for forwarding this recommendation to Greenland.

- *Catch limits [of narwhals] for West Greenland provided by the JWG [NAMMCO-JCNB Joint Working Group] be followed.*

The MCC was also presented with five recommendations from previous years, pertaining to zero catch limits, that SC/29 strongly reiterated. However, the MCC could not reach consensus for forwarding these recommendations to Greenland. These are listed below:

Narwhal

- *To implement an immediate reduction to zero catch of narwhals in all three management areas of East Greenland.*

Beluga

- *Implement seasonal closures for the hunt of belugas in West Greenland.*
- *Make sure no hunting of belugas be allowed at any time in the area south of 65 degrees North in West Greenland.*
- *Keep belugas in East Greenland fully protected, as there is insufficient information to perform an assessment of belugas in East Greenland.*

Harbour porpoise

- *Implement the management advice given on harbour porpoise in West Greenland (i.e., no more than 2900 total removals, i.e., including an assumed quota for unreported individuals).*

The Council took note of the new proposals for conservation and management forwarded by the MCs to the Parties.

Iceland, seconded by the Faroe Islands and Norway, expressed concerns that a consensus could not be reached in forwarding a zero-catch advice to a Party, despite the SC reiterating such a recommendation and signalling a significant threat of extirpation within a few years with a continued hunt. The precautionary principle was not followed, and this special situation needed to be further addressed within the Council and amongst the Heads of Delegation (HoDs).

Greenland informed that the Government of Greenland considered the situation in East Greenland as very serious. It was decided, however, to allocate quotas for beluga and narwhal in East Greenland, citing issues of food security.

The Chair noted that scientific recommendations were at the core of NAMMCO advice, but that other issues such as food security for small communities also represented important realities. He noted further that NAMMCO should address how to tackle a non-consensus over recommendations from the Scientific Committee.

The new recommendations for research (FI08), with implications for stock monitoring endorsed by the MCs and forwarded to the Parties, deal with several topics and species, and concern all Parties

- All Parties: killer whale (1)
- Faroe Islands: harbour porpoise (2), white sided dolphin (4), pilot whale (3)
- Greenland: narwhal (2), dolphins (2), walrus (3)
- Iceland: harbour porpoise (1), dolphins (1)
- Norway: harbour porpoise (6)

The MCs did not formulate any new requests for advice from the SC. All active requests, including modifications to existing requests, are summarised in NAMMCO/SC/30/04.

The MCs recommended a status change for certain requests. The full list of these requests and their respective status changes as approved by the Council can be found in Appendix 4.

The MCs recommended to Council that some Requests to the SC should be considered as answered (Request R-1.5.4, R-2.3.1, R-2.6.3rev). The Council agreed to close these requests.

The MCs also recommended that two active requests concerning environmental issues, to which the SC had provided some answers, but that remained fully pertinent, be considered as standing requests (R-1.1.10 and R-1.5.3). This was agreed upon by the Council.

The MCs recommended that answering two requests (R-1.1.9 and R-1.2.1) not be considered a priority for the SC, which was agreed upon by the Council.

SC/29 recommended to the Council eight principles, listed below, for enhancing and systematising a precautionary approach in the management of cetacean and pinniped stocks within the remit of NAMMCO.

SC/29 principles for integrating a precautionary approach in NAMMCO's management of cetaceans and pinniped stocks:

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.

The SC also recommended the three criteria listed below, to be used for prioritising the assessment of marine mammal stocks subjected to removals (not listed in any order of priority):

SC/29 criteria for prioritising the assessment of marine mammal stocks with removals:

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

As the suitable regularity of surveys and assessments is stock specific and dependent on their conservation status, the SC recommended that a standard term of reference for any assessment group be to define the regularity of abundance surveys and assessment for each specific case (species/stock).

After inquiring for and receiving from the SC further clarifications about principles 2, 3, 4, and 7, the MCs agreed to recommend that the Council endorse the eight principles proposed, as well as the three criteria for prioritising stock assessment.

The Council adopted the eight principles recommended by SC/29 for ensuring a precautionary approach in NAMMCO's management of cetacean and pinniped stocks, as well as the three criteria for

prioritising assessment of stocks. It agreed that a standard term of reference for any assessment would be to define the suitable regularity of abundance surveys and assessments for each specific case (species/stock).

Worth noting, the Council also agreed that the adoption of the eight principles and the three criteria had consequences that should immediately be reflected in the prioritisation of the assessment of stocks by the SC. Several stocks subjected to removals have not been assessed at all or have been assessed more than 10 years ago: ringed seals and bearded seals off Greenland and Svalbard, grey seals off the Faroe Islands, pilot whales off the Faroe Islands and Greenland, bottlenose whales off the Faroe Islands and Greenland, killer whales off Greenland, and dolphins off the Faroe Islands and Greenland.

Consequently, the Council agreed that:

- The priority of assessing dolphins in 2023 should remain high.
- The review and assessment of bearded seal and ringed seal stocks should progress and be completed in 2023–2024.
- The assessment of pilot whales should be postponed to, but not later than, 2025 so the upcoming abundance estimates generated through NASS 2024 can be incorporated.
- The SC should be asked to propose a long-term plan for the other species, considering both the criteria adopted and the need of the Parties in terms of management advice.

The Council also acknowledged that this prioritisation had strong implications for the Parties involved and their scientists: it requires the Parties to prioritise providing the necessary information in time for the assessment meetings, i.e., the data collection and analyses related to, e.g., abundance estimates, life history parameters, and stock structure.

As a result, the Council agreed to forward a new request for advice to the SC:

R-1.6.8: The Council tasked the Scientific Committee to:

a) Complete its work on assessing the bearded and ringed seals in 2023 and 2024.
b) Prepare a tentative long-term plan (10-15 years) for the assessments of all the stocks within the remit of NAMMCO to be presented to the Council at its next meeting.
c) Propose a system for categorising the status of these stocks reflecting abundance, status of knowledge, and levels of removals to be presented to the Council at its next meeting.

As the adoption of the 8 principles and prioritisation criteria should be immediately implemented in the prioritisation of the work of the SC, the Council agreed to modify the SC proposed 2023–2025 workplan accordingly (see item 5.2).

In relation to the MINTAG project, the Chair emphasised the importance of the agreed financing from the five partner countries and NAMMCO being continued, both with regards to direct costs and providing the in-kind funding allowing the deployment of the tags on the whales.

Discussion

The SC noted the inability of the MCC to endorse a recommendation for zero narwhal removals in East Greenland that follows the precautionary approach as adopted by Council 30 (2023).

5.2. SC WORK PLAN ENDORSED BY COUNCIL 30

The Council endorsed the following workplan for the SC for 2023–2025 (Table 1). Generally, the SC was advised to keep in mind the Council's recommendation of no more than four in-person WG/WS meetings per year, although the most important issue was to remain within the funding allocation.

As mentioned earlier, the Council recognised and agreed with the implication for the Parties, namely, to make sure that the necessary collection of information and analyses be prioritised and completed on time, e.g., regarding abundance estimates, catch data, life parameters, and stock structure. In

particular, reference was made to the dolphin and pilot whale data (Faroe Islands, Greenland, Iceland), bearded and ringed seals (Greenland, Norway), and the analysis of NASS 2024 survey data (all Parties).

Table 1. SC Workplan endorsed by Council 30. Activities in grey were already held at the time of the Council 30 meeting; tbd: to be decided.

2023	2024	2025
WG and WS meetings: Panarctic Bearded Seal WS: 21-23 March, online Coastal Seal WG: 8-11 May, Copenhagen WGHARP (ICES-NAFO-NAMMCO): 4-8 September, Tromsø Ringed Seal WG: Several short online meetings starting early Fall Dolphins WG: fall 2023, location tbd - Narwhal and Beluga in East Greenland WG: late 2023, location tbd	**WG and WS meetings:** Bearded Seal WG (or late 2023) Ringed Seal WG Walrus WG Harbour Porpoise WG (Iceland) NAMMCO-JCNB Joint WG	**WG and WS meetings:** Large Whale Assessment WG Pilot Whale WG Abundance Estimate WG
Other meetings and activities: MINTAG: testing on carcasses: F0, January; DK & JP, February; NO, Spring, StG, IS Summer ICES BWKSEALS: May, Copenhagen & hybrid NASS SpG: meetings online (Spring) & presential (Fall) MINTAG: test tags deployment work, summer - MINTAG StG: meeting online (Fall)	**Other meetings and activities:** NASS SpG: meetings online & presential MINTAG StG: online meetings MINTAG: deployment field work and analysis NASS surveys	**Other meetings and activities:**

Discussion

The SC discussed an update on the work plan, in relation to the long-term assessment plan (item 11.2.), under item 16.

5.3. UPDATE ON NAMMCO PROCESSES

5.3.1. Working Group on Enhancing User Involvement in NAMMCO Decision Making (UIWG)

Council 29 (2022) decided to establish under the Management Committees a WG on enhancing user involvement in NAMMCO decision making (UIWG).

Council 30 approved the proposed Terms of Reference (ToRs) of the UIWG and agreed to allocate some funding for the years 2023, 2024, and 2025. The ToRs are:

i) To consider and give advice on how to best initiate, improve, and strengthen users' involvement in NAMMCO to produce better decisions and strengthen the legitimacy of decisions. This will involve finding best practices on how to co-produce knowledge by stakeholders (users, scientists, managers) to obtain the best ecosystem-based management of marine mammals and their use by the societies that utilise them.
ii) Give concrete recommendations on how to advance the work and how to monitor the progress.

Council 30 also underlined the importance of having members with expertise in how to incorporate user knowledge in research and management processes. It also noted that it would be necessary to look outside the immediate NAMMCO "family" to benefit from the experiences of people/organisations that have been/are dealing with these issues, as NAMMCO and its SC have very limited experience in this.

The WG should be composed of members appointed by the member countries that combined should represent/cover:

- Users (which can be nominated by organisations), with at least one representative from each member country.
- Natural and social scientists, including experts on indigenous knowledge and rights in international processes.
- Managers.

John-André Henden (Norway) presented his experience on incorporating user knowledge in a scientific advisory process.

Summary

In the case of the recently red-listed, but still harvested, population of Willow Ptarmigan in Northern Norway, the experience was that a protocol for structured stakeholder involvement constituted a highly functioning process for involving stakeholders in modelling efforts for the purpose of identifying drivers of past and current dynamics, as well as for deriving predictions of the near future state of the population (Henden et al. 2020). Several positive and useful experiences came from the collaborative process. Early involvement of all major stakeholders was decisive in providing legitimacy and trust in the objectives of the process and thereby for the focus and progress of the work, the success of the endeavour largely depended on the willingness of the people involved, and that building social capital among all participants involved directly from the start was essential for building the trust needed to ensure an effective functioning among social groups with different interests and values. Some recommendations based on the key lessons learned from several cases within a larger ecosystem project (SUSTAIN) in Norway was, 1) Start the stakeholder process as early as possible, preferably when the case study is elaborated, 2) Aim at building strong social capital and do not underestimate the time and willingness it will require to reach it—it takes time to establish trust, 3) Provide a diversity of occasions to meet and discuss, to ensure that various stakeholders will commit to the case and their needs will be met, 4) Use direct and dynamic communication channels and develop the communication plan with all actors and 5) Pay attention to stakeholder expectations and take rapid actions to fulfil them (cf., Hamel et al. 2022).

Discussion

Henden clarified that one of the goals of the UIWG is to determine the best way to integrate user knowledge into the NAMMCO advice-giving process. The integration of different knowledge systems does not need to follow a one-size-fits-all approach. Martin Biuw (Norway) expressed that one task of the UIWG lies in exploring past examples of such processes to develop a more streamlined approach and to understand which approach could work in each specific case study. Some concern was expressed over the title of the group, namely that "enhancing" user involvement might imply placing more value on user knowledge than on scientific knowledge. However, Desportes clarified that the aim of this group is not to prioritise user knowledge over scientific knowledge, but rather to involve users throughout the process, potentially improving the successful implementation of a given SC recommendation. It was noted that such a process is logistically challenging, expensive, and time-consuming, and that success is not always guaranteed.

Henden explained that the key for such a process to work is to be open-minded, build trust among different stakeholders, and agree on the approach to be taken from the beginning. This ensures that the methods used in the assessment are approved, and the results are convincing to all parties

involved. The SC recognised that, where financial interests play a major role, it may not be possible to reach consensus.

The SC welcomes any knowledge that can improve the assessments of stocks. Relating to narwhals in East Greenland, the SC noted that user knowledge is already included to a large extent in the assessment. Most of the work in the field involves hunters, some of the information in their catch reports are used as data in the assessments, and the latest aerial survey involved hunters from beginning to end (see item 10.1).

6. INTERACTIONS WITH OTHER ORGANISATIONS

6.1. ASCOBANS

Desportes gave a brief overview of ASCOBANS activities in relation to NAMMCO species, areas, and issues of direct interest, including relevant topics addressed by the 28th Advisory Committee (AC 28) meeting.

Desportes and Garagouni followed (online) part of the AC 28 meeting (September 2023). The AC 28 meeting dealt with only a few topics/species of direct interest to NAMMCO. One relevant topic, however, is the ASCOBANS review of disturbances, including pollution and hazardous substances, as well as recreational sea use. NAMMCO Secretariat will follow the progress made on these issues.

The intersessional Working Group on *Lagenorhynchus*, that was formed by AC 26 (2021), had not had any meetings or activities since then. As a rule, NAMMCO Secretariat keeps the ASCOBANS Secretariat informed of the NAMMCO activities on species of special interest to ASCOBANS. The ASCOBANS Secretariat was informed that NAMMCO SC would convene a working group on dolphins and was provided with the list of participants, including invited experts. The report of the Working Group was also forwarded to ASCOBANS when it was released.

It should be noted that ASCOBANS propose to hold a workshop in combination with the next annual conference of the European Cetacean Society (April 2024, Sicily) on 'Species in the Agreement Area that Require Further Attention (including *Lagenorhynchus*)'.

6.2. ICES

Guðjón Már Sigurðsson (Iceland) reviewed the 2023 activities in ICES which had some relevance to the work of the NAMMCO SC, details of which were provided in NAMMCO/SC/30/25. This included work in the ICES Working Group on Marine Mammal Ecology (WGMME), the Working Group on Bycatch of Protected Species (WGBYC), and the expert Workshop on Seal Modelling (WKSEALS). The ICES Annual Science Conference (ASC) generally includes sessions with marine mammals as an integral part, occasionally also sessions entirely devoted to marine mammals. In 2023, the ASC had a large session on by-catch.

6.3. OSPAR

Garagouni informed of a Regional Action Plan (RAP) for Underwater Noise being developed by OSPAR under their Strategic Objective 8 ("to reduce anthropogenic underwater noise to levels that do not adversely affect the marine environment"). A workshop was held in 2023 with stakeholders from science, NGOs, industry, and policy, to devise relevant Actions that could be implemented as part of this RAP (NAMMCO/SC/30/FI14). Key points of relevance to the NAMMCO SC were the consideration of renewable energy, shipping/boating traffic, and seismic surveys, as the most pressing issues to be addressed, as well as the need for information on the effects of noise on all marine species, disturbance thresholds, potential cumulative effects on populations, and ways to monitor these impacts.

Desportes informed of a recently received update on developments regarding the North Atlantic Current and Evlanov Sea basin Marine Protected Area (NACES MPA), which the SC had commented

upon on two occasions. The NACES MPA was designated at OSPAR's Ministerial Meeting in 2021 (OSPAR Decision 2021/01). IN 2023, the OSPAR Commission endorsed the publication of a revised nomination proforma for the NACES MPA (OSPAR Publication 2023/989) and agreed to broaden its conservation objectives by including in the scope of the NACES MPA additional OSPAR listed features (species and habitats) and the seabed, ocean floor, and subsoil. The formal instruments amending OSPAR Decision 2021/01 and Recommendation 2021/01 on the NACES MPA management are OSPAR Decision 2023/01 and OSPAR Recommendation 2023/01 respectively, that will enter into force on 16 January 2024.

6.4. OSTROBOTHNIAN FISHERIES ASSOCIATION

El bani Altuna informed the group about the "Seal management under a trade ban" webinar that the Secretariat attended in November 2023 (NAMMCO/SC/30/FI15). The webinar served as the concluding session for a three-year project, during which the organisers (Ostrobothnian Fisheries Association, Finland) and their partners from the Baltic region explored the interest and use of seals as valuable game, along with the challenges of managing such a resource under the EU ban. While the Secretariat acknowledged that the webinar might not have been of strong interest for the SC, it was considered an important step in building alliances between NAMMCO countries and Baltic countries, as they all face similar issues regarding seal resource management since the introduction of the seal ban.

6.5. ARCTIC COUNCIL

Desportes briefly described the continued relationship between NAMMCO and the Arctic Council, AMAP, and CAFF. There has been a pause in the activity of the Arctic Council and its Working Groups because of the war in Ukraine. Therefore, although contacts have been maintained between the Secretariats, no joint activities have been conducted in 2023. As a consequence, the Panarctic Bearded Seal Workshop (see item 9.1.2), which was conceived as a joint activity, was led by NAMMCO alone, although the form, programme, and participants—with the exception of the Russian scientists, who did not join—remained those agreed upon.

7. COLLABORATIVE PROJECTS

7.1. MINTAG PROJECT

Mads Peter Heide-Jørgensen (Greenland) summarised the progress of the MINTAG project in 2023 (NAMMCO/SC/30/15).

Summary

The primary focus of the MINTAG project in 2023 was the improvement of tag retention on whales, balancing ballistic performance, reliable delivery systems, and evaluating new transmitter components. Comprehensive tests were conducted on two tag types—one designed for minke whales (short) and another for fin whales (long). Testing occurred in Japan, Denmark, the Faroe Islands, and at the Icelandic whaling station. These tests addressed precision/ballistics, attachment/detachment from the carrier, penetration depth, stop plate functionality, and other aspects.

Field deployments began in Japan using the long fin whale tag with two retention cones. Documentation through videos and images revealed that the tags were not fully embedded in most deployments, with the front retention cone likely causing incomplete penetration. Despite this, one fin whale tag provided 31 days of positions. Subsequent tests led to the decision to remove the rear cone, replacing the cutting tip with a large, three-bladed broadhead to enhance penetration of the front cone. This modified design was used in subsequent trials.

In Greenland, the initial approach to tagging fin whales involved a large vessel in inshore areas, but the whales proved too skittish to approach successfully. Consequently, the tagging operations were relocated offshore to areas accessible only by small dinghies/outboard motorboats. Despite

encountering challenges, such as deployments being too low or too high, one tag managed to provide 18 days of position data.

In Svalbard, attempts to use a fin whale tag from small boats faced issues with the carrier, resulting in a failure of penetration on the whale. Instead, the minke whale tag was deployed from a low-elevation boat, highlighting the difficulties in instrumenting minke whales due to their high speed and unpredictable movements. Despite these challenges, one tag provided positions for 17 days, and another for 6 days.

Additionally, a minke whale tag was utilised on a fin whale off the Norwegian coast, resulting in a deployment duration of 20 days.

In November, tagging operations involving humpback and killer whales highlighted the ongoing challenges of fully embedding the tags under the skin of these whales.

The status and future of the MINTAG project were deliberated in an in-person meeting with Wildlife Computers during the MINTAG Steering Group meeting on January 21–22. Wildlife Computers reported that the use of electronic components, specifically the new artic circuit, in an older version housing deployed on right whales demonstrated the predicted functionality of batteries and transmitters, with no premature battery exhaustion.

The MINTAG Steering Group decided to concentrate on advancing the minke tag, opting for two new designs: one based on the housing with the retention cone and another with petals, similar to those successfully used in older tagging studies. Several minor modifications to the designs of these two tags were agreed upon. The Steering Group was informed that Japan, Norway, and Iceland expressed readiness to conduct testing of the two new tag types from suitable platforms in the summer of 2024. To maintain an adequate sample size, it was recommended that each of the three deployment groups should have 5 of each tag configuration (Table 2).

Table 2. Overview of tags for each team. KK: Kenji Konishi, MB: Martin Biuw, CL: Christian Lydersen, SG: Sandra Granquist.

Country	PI	Month	Area	Target species	Tags needed
Japan	KK	April	North Pacific & Okhotsk Sea	Minke	10 (5 of each kind)
	KK	June to August		Baleen whales	
Norway	MB	Mid-May	Lofoten	Minke	10 (5 of each kind)
	MB	Mid-June (from 19/06) to mid-August	West Svalbard & Barents Sea	Minke and Fin	
	CL	Early July (from 07/07) to end of August	Svalbard	Fin	
Iceland	SG	Late July/August	Faxaflói or Akureyri	Minke	10 (5 of each kind)

Discussion

Desportes highlighted the importance of having the right logistics in place during the field season 2024 for successful tagging efforts, which was also emphasised by the HoDs. The SC noted that optimal platforms were not available for all the field efforts in 2023 and **agreed** that such platforms should be made available for field efforts in 2024.

The SC **approved** the plans of the MINTAG StG for continuation of experimental deployments in 2024.

7.2. DISSEMINATION: GUARDNA PROJECT

El bani Altuna gave an overview of NAMMCO's Educational Programme, specifically focusing on the GUARDNA project (NAMMCO/SC/30/22). GUARDNA, a three-year initiative (2024–2026), aims to educate and empower North Atlantic youth (ages 7 to 20) on ocean conservation and sustainability,

using marine mammals as the central theme. Educational materials will include information cards covering marine mammals, their uses, users, and threats. Practical exercises and activities related to NASS 2024 and MINTAG will also be featured. These materials will be tailored for different age groups and translated into six languages spoken in NAMMCO countries. El bani Altuna emphasised the importance of engaging students in high-profile research, such as NASS 2024 and MINTAG, and encouraged SC members to express their interest in participating in these outreach activities.

7.3. COOPERATION WITH JAPAN

7.3.1. Northeast Atlantic–Northwest Pacific Ecosystems

Tsutomu Tamura (Japan) presented ongoing work on determining the feeding ecology of the North Pacific common minke whale (NAMMCO/SC/30/24).

Summary

Intersessional discussions were held by Japanese and Norwegian scientists regarding a collaborative research proposal to understand the factors behind annual changes in distribution and feeding ecology of western North Pacific common minke whale. Results of this research would be compared with those for the North Atlantic common minke whale, which was investigated previously using similar methods. The objective of the collaborative research proposal was to investigate the environmental causes behind the annual change in distribution and prey species of the North Pacific common minke whale. To carry out this project, a series of sighting, catch, oceanographic, and prey species data is available in Japan for the period 1994–2019. As a first step, two specific analyses were proposed: i) check whether there is a relationship between common minke whale distribution and water temperature on a map. For this purpose, GIS software will be used to map whale distribution and water temperature overlapped, and ii) analyses of blubber thickness, girth length, and body weight (indicators of body condition of common minke whales) employing a GAM model using Fused Lasso to investigate spatial effects, yearly trends, and effects from several covariates (research year, calendar day, water temperature, sex, maturity, latitude, longitude, and prey species).

Discussion

Biuw highlighted that this project is still in the early stages and that considerable effort will be put into it during 2024. In terms of establishing a more formal collaboration with NAMMCO as a whole, rather than solely with Norway, Luis Pastene invited the SC to evaluate the analyses presented and propose further steps. He also noted that the comparison with the North Atlantic ecosystem will be conducted once the analyses on its Pacific counterpart are near completion. There are further plans to expand the project to include more species, such as fin whales, for which Iceland has comparable data.

In order to continue these discussions intersessionally, the SC **agreed** that Pastene be the primary coordinator of future discussions, that Sigurðsson become the point of contact regarding Icelandic data, and that Lindstrøm and Heide-Jørgensen also be included in this project. Finally, the SC concurred that the research questions and methodological approach presented by Tamura were sound, and suggested the incorporation of more remote sensing data, e.g., to determine zooplankton distribution.

7.3.2. Further collaboration

Desportes was invited in December to Japan by the Ministry of Foreign Affairs in order to discuss possibilities for strengthening the cooperation between NAMMCO and Japan, with participants from the Fisheries Agencies and the Institute for Cetacean Research. She summarised the outcomes of her visit with regards to strengthening the ties between Japanese and NAMMCO researchers and increase the exchange of expertise. Has also been arranged conversations with scientists from different universities with different research subjects to discuss possibilities for cooperation: the Tokyo University of Agriculture / Hokkaido Campus (harbour and spotted seals research, including interaction with fisheries and tourism, elect of climate change), the Department of Ocean Sciences Laboratory of Cetacean Biology / University of Marine Science and Technology (cetacean research) and the Center

for Southeast Asian Studies /Kyoto University (research on acoustic and interaction with fisheries and tourism).

Discussion
Japan considers it vital to keep these communication channels open, not just by continuing to observe the SC meetings, but also by participating more directly in NAMMCO's technical WGs. Japanese researchers are already involved in NAMMCO's technical WG on Genetics and expressed interest in participating in the WG on Abundance Estimates.

The SC **agreed** with the compilation of a list of ongoing collaborative projects related to marine mammals between Japanese and NAMMCO countries' scientists.

To facilitate exchange and cooperation between NAMMCO and Japanese scientists, the SC **proposed** that NAMMCO and Japan establish a joint travel fund rendering easier face-to-face meetings, as well as participation in fieldwork and projects.

7.4. OTHER COLLABORATIONS

No further collaborations with other countries were brought forward.

8. ENVIRONMENTAL/ECOSYSTEM ISSUES

8.1. MARINE MAMMAL / FISHERIES INTERACTIONS

8.1.1. Review and status of active requests (R-1.1.5, R-1.1.9, R-1.1.10)

R-1.1.5 (1997, standing) *asks the SC "to periodically review and update available knowledge related to the understanding of interactions between marine mammals and commercially exploited marine resources."*

The Working Group on By-Catch (BYCWG) is making progress on examining the risk of interactions between marine mammals and fishing gear (see next item).

R-1.1.9 (2023, ongoing but not prioritised) *asks the SC "in addressing the standing requests on ecosystem modelling and marine mammal fisheries interaction, to extend the focus to include all areas under NAMMCO jurisdiction."*

The SC acknowledges the request and will continue to monitor the development of ecosystem modelling approaches.

R-1.1.10 (2022, standing) *asks that "in light of the distributional shifts seen under T-NASS 2007 and later surveys, the SC should investigate dynamic changes in spatial distribution due to ecosystem changes and functional responses."*

The results of the upcoming NASS 2024 survey will provide further insights relevant to changes in the spatial distribution of cetacean species. The SC recognises the value of such a spatial modelling exercise, but it will require dedicated effort and likely additional funding.

8.1.2. Working Group on By-Catch: Data call for exposure assessment

Convenor of the By-Catch Working Group (BYCWG), Desportes, provided an overview of the 8th meeting of the group, which was held online on October 6, 2023 (NAMMCO/SC/30/05) and chaired by Kimberly Murray (NOAA Northeast Fisheries Science Center, USA). All four NAMMCO member countries participated in this meeting.

Summary
The overall ToRs of the WG were defined by SC/21: i) Identify all fisheries with potential by-catch of marine mammals; ii) Review and evaluate current by-catch estimates for marine mammals in NAMMCO countries; iii) If necessary, provide advice on improved data collection and estimation

methods to obtain best estimates of total by-catch over time. To date, the WG has only reviewed by-catch estimates generated using data from observer/reference fleet monitoring for a few gillnet fisheries known to have a high probability of by-catch for harbour porpoises and coastal seals. It has endorsed by-catch estimates for marine mammals in the Icelandic lumpsucker fishery and for harbour porpoise and grey and harbour seals in the Norwegian coastal gillnet fisheries.

The WG was asked by SC/28 to proceed with ToR i and determine how best to assess the risk of marine mammal by-catch in fisheries taking place in the waters of NAMMCO and for which there are no by-catch estimates and no or limited by-catch monitoring. The WG agreed that, as the fishers' reporting of by-catch is not reliable, the best way to progress with ToR i was to perform a risk assessment.

The WG specified that its role was to define the *individual* exposure to being by-caught, since defining the population consequence of by-catch was within the remit of the species and assessment WGs. The WG agreed to conduct a likelihood analysis, i.e., identify the likelihood of becoming by-caught for different species in different areas (based on the co-occurrence of species distribution and fishing effort), with the purpose of providing advice on the prioritisation of monitoring efforts. The WG intended to formulate a data call through which to collect all pertinent information on fishing and monitoring effort. The WG also agreed that a cooperation with ICES WGBYC should be sought.

At its 8th meeting, the WG progressed in defining the characteristics of the data call, i.e., the geographical (ICES rectangles) and temporal scope (data from the past five years), the target fisheries (larger and smaller vessels, both national and foreign effort, both professional and recreational fisheries), and the level of information needed on vessels and fishing effort. Further information on the nature and precise protocol of monitoring programs was, however, needed before that element of the data call could be precisely formulated.

The WG agreed that the NAMMCO Secretariat contact the respective Fisheries Departments of the member countries to request the following information:

1. Is there a *fleet register*, sorted by
   port
   vessel size
   gear type
2. Are *recreational vessels* registered/licensed and is there information on their
   gear type
   fishing effort/number of trips
3. At what *spatial resolution* is fishing effort recorded, sorted by
   vessel size
4. What data are available for *smaller vessels* (i.e., those under 12 m in Norway, under 15 GT in Faroe Islands, under 90 GT in Greenland)
5. Are there records of the number or percentage of *foreign vessels* operating in the national fishing areas
6. What *monitoring programs* exist, and what is
   the *objective of each program*, e.g., policing or counting protected species bycatch the *monitoring protocol*, i.e., precisely what is being monitored and how.

Following this recommendation, Garagouni sent an e-mail to the Fisheries Directorate of the member countries requesting answers to those questions. The Faroe Islands, Greenland, and Norway have responded, but Iceland has not provided any answer.

Discussion

Given that the BYCWG cannot progress in its tasks until all answers are provided, the SC **recommended** that Iceland provide an answer to the request as soon as possible, so the WG could proceed with the data call. Icelandic members **agreed** to contact their fisheries directorate to ask them to provide the requested information to the Secretariat.

It was highlighted that the current aim of the BYCWG is not being pursued *instead of* calculating actual by-catch rates. Rather, in the absence of by-catch reporting for many fisheries, the aim is to determine areas were exposure to by-catch is likely to be highest, in order to provide advice on where to concentrate monitoring efforts.

Sigurðsson agreed to take on the role of convenor of the BYCWG.

8.2. MULTI-SPECIES APPROACHES TO MANAGEMENT AND MODELLING

8.2.1. Review and status of active requests (R-1.2.1, R-1.2.2)

R-1.2.1 (2023, ongoing, but not prioritised) *asks the SC "to consider whether multispecies models for management purposes can be established for the North Atlantic ecosystems and whether such models could include the marine mammal compartment. If such models and the required data are not available, then identify the knowledge lacking for such an enterprise to be beneficial to proper scientific management and suggest scientific projects which would be required for obtaining this knowledge."*

This request was addressed in item 8.2.2.

R-1.2.2 (1995, standing) *asks the SC "in relation to the importance of the further development of multispecies approaches to the management of marine resources, to monitor stock levels and trends in stocks of all marine mammals in the North Atlantic."*

The SC monitors and reviews information on stock levels for all marine mammal species within the NAMMCO remit.

8.2.2. Discussion of workshop on model portfolio

SC/28 proposed that a workshop on multispecies models be planned, but the relevant expertise was lacking during the SC/29 meeting. It was pointed out that considerable progress has been made in this field, with multiple examples from Norway.

It was **agreed** that SC members involved in multi-species ecosystem modelling projects update the list of projects being carried out (provided to SC/27) for the next SC meeting, as well as provide information on the uncertainty or reliability of these models. The proposed workshop will be postponed until specific management questions that can possibly be answered are identified.

8.3. ENVIRONMENTAL ISSUES

8.3.1. Review and status of active requests (R-1.5.3)

R-1.5.3 (2023, standing) *asks the SC "to monitor the development of the Mary River Project and assess qualitatively or, if possible, quantitatively the likely impact and consequences on marine mammals in the area."*

The SC **agreed** that some answers to this request were provided by the Joint NAMMCO-JCNB Disturbance Workshop in December 2022. The SC **recommended** that, at its next meeting, the Joint Working Group should provide further monitoring updates.

8.3.2. Updates

There were no further updates regarding environmental issues.

9. SEALS & WALRUS STOCKS – STATUS AND ADVICE TO THE COUNCIL

9.1. BEARDED SEAL

9.1.1. Review and status of active requests (R-2.7.1)

R-2.7.1 (2023, ongoing) *asks the SC "To complete its review and assessment of bearded seals no later than 2024."*

The SC provided a response to this request under item 9.1.2.

9.1.2. NAMMCO Panarctic Bearded Seal Workshop

Christian Lydersen (Norway) presented the report of the NAMMCO Panarctic Bearded Seal Workshop (BSWS) (NAMMCO/SC/30/14), which was held in online format on March 21–23, 2023. The meeting was co-chaired by Peter Boveng (NOAA Alaska Fisheries Science Center, USA) and Lydersen.

Summary
The purpose of the BSWS was to review new information since 2010 (Cameron et al. 2010) and, based on all the information available, assess the status and trends of the species throughout its range and identify threats and critical knowledge gaps. Specific objectives were to i) Consider new knowledge from 2010–present (since the Cameron et al. 2010 review of bearded seals); ii) Examine progress in defining stock structure by exploring outcomes of new genetic analysis and other data informing stock structure (e.g., Indigenous knowledge, distribution and movements, hunting patterns, vocalisations, etc.); and iii) Review and assess population/stock abundance, trends, status, health, and condition.

Results from an ongoing circumpolar **genetic study** on bearded seals were presented at the Workshop, strongly supporting the division between the Atlantic and Pacific bearded seal subspecies (Figure 1). Within the Atlantic, preliminary results pointed to the following genetic units:

1) Svalbard–East Greenland–South Greenland
2) Hudson–Davis Strait
3) Northwest Greenland (Melville Bay)

Additional structure was considered possible between Hudson and Davis Strait seals, and samples from Melville Bay were expected to cluster with those from the Canadian High Arctic (Grise Fjord and Resolute), but additional data and analyses were needed to determine that.

Currently, there is no evidence supporting different genetic units in the Pacific, but the Workshop agreed that with more genetic sampling and analysis, separated genetic units might eventually be identified there.

Results from **tagging studies** presented at the workshop indicate that juvenile bearded seals in Alaska are associated with nearshore and shallow waters of the continental shelf and that their movements are correlated with sea ice changes. Juvenile seals prefer intermediate ice concentrations and in years with more widespread intermediate ice, they would be also more dispersed. While they haul out on both sea ice and land, their haul-out durations on land are usually shorter. Acoustic monitoring of bearded seal populations in the eastern Chukchi and northern Bering seas revealed that bearded seal calling activity increased from September to February, reaching its peak from March to June before abruptly ceasing. The timing of this cessation aligned with an earlier sea ice retreat each year, indicating a correlation.

In the Baffin Bay area, bearded seals show a migration pattern closely tied to ice conditions. An increase in catches occurs on the Greenland side of Baffin Bay when the eastward expanding pack ice reaches the region in January. This high catch rate continues until May, with the area with highest catches following the open water moving northward along the coast until late June–July, when bearded

seals are primarily caught on the Canadian side of Baffin Bay.

In Svalbard, bearded seals are found in coastal waters around the archipelago and occupy drift-ice areas during the spring mating period. Mother-pup pairs have small home ranges during the nursing period, with pups gradually spending less time hauled out and more time diving as they develop. Adult seals exhibit individual movement patterns and are considered generalists, with 50% home ranges covering about 20 km². They primarily dive and spend minimal time hauling out, except during peak moult. Passive acoustic monitoring in Svalbard has revealed local variation in the vocal behaviour of male bearded seals. The vocal season varies, with the shortest duration in Kongsfjorden (west

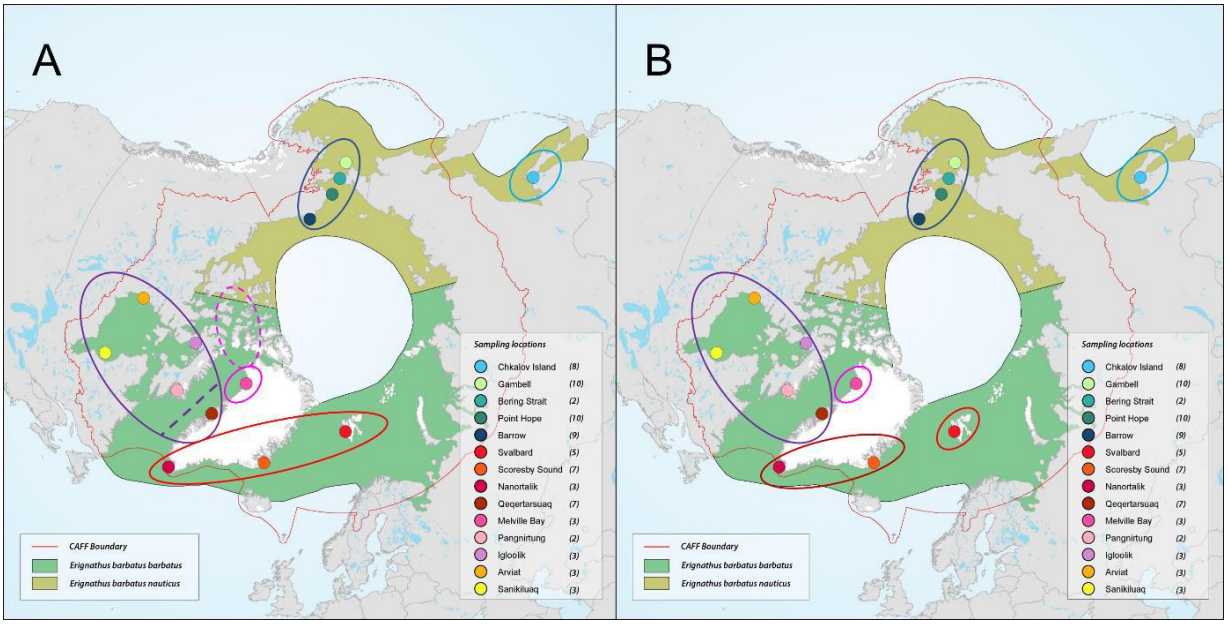

Figure 1. Management zone delimitation for bearded seal in the Panarctic based on preliminary results from ongoing genetic analyses (A) and non-genetic (e.g., tracking and acoustics) studies (B). Dashed lines indicate potential boundaries not confirmed by preliminary results but expected with additional sampling. (source: Map provided by CAFF).

Svalbard) and the longest in northeast Svalbard. A higher abundance of vocalizing bearded seals has been identified in the north and east of Svalbard, and vocalisations resembling those of the White Sea population have been recorded. Vocal activity is lower in Kongsfjorden, suggesting a local population decline or distribution shift, but does not align with the presence of sea ice.

Bearded seals in Alaska are sustainably harvested by Alaska Natives under the US Marine Mammal Protection Act. Annual harvest estimates reach around 6,700 seals, with participation and use of seal products showing stable or declining trends. Factors affecting the numbers of seals struck and lost are poorly documented. In Svalbard, bearded seal hunting is permitted with restrictions, resulting in varying but low annual numbers (2-34). In Greenland, the number of bearded seal catches has declined from around 2,000 in the early 1990s to approximately 1,000 in recent years, particularly in southeast and southwest Greenland, potentially influenced by reduced ice transport with the East Greenland current and decreased consumption of seal meat.

Combining **Indigenous and local knowledge** with technological tools provides information on bearded seal behaviour, habitat use, and abnormal conditions. Group interviews conducted in coastal communities in Alaska yield detailed information about movements and habitat use, including rare behaviours like bearded seals hauling out on land and traveling up rivers. Indigenous knowledge also confirmed that yellow blubber in old bearded seals is a normal characteristic, providing important context for harvested seals with yellow blubber, because there has been no adequate scientific explanation for this relatively common occurrence.

The U.S. has conducted **aerial surveys** in the Bering, Chukchi, and Beaufort Seas between 2012 and

2021 to estimate seal densities, with over 500,000 bearded seals estimated in the Bering and Chukchi Seas. Close-kin mark-recapture methods using genetic samples from harvested seals (N = 1,759) are being employed to improve abundance estimates and demographic parameters. The current estimate is approximately 232,000 bearded seals, but including heterogeneity in adult male breeding success increases the estimate to around 409,000. Future steps include refining the model and increasing sampling for better precision.

Limited data are available from Southwest Greenland, Northeast Greenland, and the Southeastern part of Greenland, but multiple surveys have been conducted in Central-West Greenland, providing potential abundance data on bearded seals from 1981 to 2022. Published estimates exist from surveys in the North Water polynya, yielding an estimate of 6,000 bearded seals in both 2010 and 2014. However, despite the availability of survey data for abundance estimation, the workshop was informed that no specific timeframe has been set for estimating the abundance of bearded seals in Greenland.

A synthesis of bearded seal abundance and density estimates from aerial surveys (1958 to 2022) across the Canadian Arctic was presented at the Workshop, revealing densities ranging from 0.02 to 0.24 bearded seals per km^2. Higher densities were observed in the Beaufort Sea and Baffin Bay-Davis Strait areas compared to other regions (Hudson Bay Complex and High-Arctic Archipelago and Ellesmere Island).

Information from Canada presented at the Workshop indicate stable bearded seal stocks in the Canadian Arctic, with most hunting taking place in Nunavut, particularly the Baffin Region. Local bearded seals average around 210 cm in length. A sampling program in Newfoundland collected data from 485 bearded seals between 1979 and 2021, revealing size and weight variations. Changes in growth and condition may be linked to ecosystem shifts and declining sea-ice in the north-western Atlantic Ocean.

In Alaska, **subsistence harvest data** has provided some insights on population trends and biological parameters. Comparing measurements and reproductive rates between different decades, female bearded seals had varying growth rates, with a recent period of above-average growth. Adult blubber thickness was generally average or above, with occasional exceptions. Pregnancy rates increased significantly in the 2010s, and the age of maturity decreased. A higher proportion of pups were harvested in the 2010s, indicating favourable conditions for growth and survival. Overall, these indicators do not show sustained declines, contrary to predictions of population decline due to climate change causing a reduction in sea ice.

In Svalbard, peak pupping occurs in early May. Pups are born weighing around 37 kg and during nursing, they grow at a rate of 3 kg/day, reaching over 100 kg in weight. Mothers have an average parturition mass of 369 kg but experience a daily mass loss of 4 kg during lactation. Male and female bearded seals have body lengths of 231 and 233 cm, respectively, with corresponding body masses of 270 kg for males and 275 kg for females. Male body condition declines from May to August due to breeding and moulting, while females experience a drop in body condition from May to June during lactation. Sexual maturity is reached at 6 years for males and 5 years for females.

Direct **physiological data** from captive bearded seals presented at the Workshop showed that bearded seals have low mass-specific energy demands and little seasonal variation in metabolic costs associated with moult. Their resting metabolic rates are consistently low throughout the year, whether in water or during haul out, and during moulting and non-moulting periods. Ongoing research aims to measure differential metabolic costs during resting, swimming, and diving activities. Despite their polar distribution, bearded seals have the lowest measured resting metabolism among phocid seals.

The **decline in sea ice** poses a threat to bearded seals, impacting their population and health. Increased exposure to **harmful algae blooms** (HABs) and neurotoxins is a growing concern. However, studies have shown that bearded seals in Alaska have lower contaminant concentrations compared to other regions. Traditional uses of bearded seals by Indigenous communities include food, oil, and various by-products, and efforts are being made to collect further data on bearded seal life history, contaminants,

and diseases. Although bearded seals generally appear healthy, the Workshop noted they have been affected by two unusual mortality events in Alaska over the last decade.

The diminishing sea ice in the Arctic has led to **increased shipping activity**, including the use of global shipping routes and regional shipping to coastal communities. Bearded seals are exposed to higher levels of vessel traffic, particularly in the summer months and within specific regions. The risk of collisions or displacement is considered low, but noise disturbance from shipping could have negative impacts, especially during the spring mating season. Currently, shipping traffic is low during this critical period, but increased year-round vessel traffic could pose a greater threat. The extent of bearded seals' avoidance of high ship traffic areas is not yet fully understood.

The reduction in sea-ice cover in Svalbard and the northern Barents Sea region is impacting bearded seals. Declining land-fast sea ice extent, influenced by the West Spitsbergen Current, creates poorer ice conditions and allows Atlantic fish and invertebrate species to migrate to high latitudes. Bearded seals have adapted by using glacier ice but will face challenges as glaciers retreat. While some seals have been observed hauling out on land, there is no evidence of pupping or nursing on land yet. Disease risks and pollution levels are a concern, with antibodies for *Brucella* and *Toxoplasma gondii* found in bearded seals. Reduced sea ice cover also affects food availability, as competition from walruses increases. Harbour seals are also expanding their distribution and displacing bearded and ringed seals in certain areas. The cumulative impact of these factors on bearded seal demographics is not well understood, but their adaptability, specialised habitat use, and diverse diet may aid in their adaptation to a changing Arctic ecosystem. However, uncertainties remain regarding diseases, pollutants, and the breeding system of bearded seals in the face of these changes.

The Workshop participants aimed to delineate **management units** for bearded seals based on genetic and other lines of evidence, such as tracking and vocalisation studies. They recognised the need to identify both demographically independent and ecologically significant populations for conservation purposes and two maps with potential management zones based on genetics and other evidence were generated (Figure 1). Efforts to increase sample size for genetic analysis were **recommended**, along with proposals for in-depth genetic studies in the North Atlantic area and obtaining abundance estimates and conducting surveys in the Atlantic Arctic were highlighted as priorities.

Discussion

The SC discussed a primary challenge in estimating the abundance of bearded seals, namely that they are rarely considered a priority species for surveys. As a result, surveys are generally not designed to target their habitat. However, counting sighted bearded seals during surveys focusing on other species may provide an indication of the minimum number of bearded seals.

Regarding hunting, it was noted that bearded seal removals in Svalbard are considered negligible, between 2 and 34 per year since 2003 from a very restricted geographical area compared to the whole archipelago.

In response to R-2.7.1, the SC **agreed** that there is insufficient processed data available to proceed with an assessment. Due to this, the SC **agreed** to postpone the upcoming Bearded Seal Working Group, originally planned for 2024. The progress will undergo a review by Lydersen and the NAMMCO Secretariat at the end of 2024. The review's findings will be presented to the SC in 2025.

To conduct a thorough assessment, old and new data from Greenland must be analysed/validated, including genetic data, abundance estimates, reliable availability correction factors, and catch data.

The SC highlighted three **recommendations** of immediate priority (Box 1) and **endorsed** the remaining recommendations of the workshop (Appendix 7).

Box 1. Recommendations pertaining to Bearded Seals prioritised by SC/30.

Recommendations for Research to Greenland

- To analyse survey data that included bearded seal sightings in Greenland.
- To obtain tracking data from bearded seals tagged in Greenland and East Baffin Island to get information on stock structures.
- To determine a suitable availability correction factor.

9.1.3. Updates

Lydersen informed that genetic analyses on bearded seals are ongoing to increase the sample size and get an indication of bearded seal stock identity in the North Atlantic.

9.2. RINGED SEAL

9.2.1. Review and status of active requests (R-2.3.3)

R-2.3.3 (2023, ongoing) *asks the SC "to complete its review and assessment of ringed seals no later than 2024."*

The SC provided a response to this request under item 9.2.2.

9.2.2. Ringed Seal Working Group

Rosing-Asvid presented the report of the Ringed Seal Working Group (NAMMCO/SC/30/08), which held two 3-hour long online meetings on 16 and 27 November 2023. The meetings were chaired by Rosing-Asvid.

Summary
The focus of the RSWG meetings was given in ToRs i–v.

i) To define management areas based on genetics and/or telemetry if possible.
More than 300 ringed seals have been tagged with satellite-linked transmitters. Their tracks indicate very little or no interactions between ringed seals in Svalbard and East Greenland and between ringed seals in East and West Greenland. There are, in contrast, many tracks showing interactions between West Greenland and the eastern part of Canada. The ringed seals in Hudson Bay, however, only have few interactions with ringed seals outside Hudson Bay. The data also indicate little or no interaction between ringed seals east and west of the area with multi-year ice that often blocks the Northwest Passage. Data are, however, limited and nothing was concluded for that area.

A tracking study in Kangia (the West Greenland fjord that holds the most productive glacier in the northern hemisphere), also revealed that ringed seals here are very stationary (only one out of 24 tagged seals left the fjord). In addition, a genetic study revealed that these seals separated from the Arctic Ringed seals about 240 kya, followed by secondary contact since the Last Glacial Maximum (about 20 kya). These seals should be regarded as an ecotype and be managed as a separate stock.

These management areas (Figure 2) based on telemetry can help determine which country/countries are responsible for the management, e.g., Svalbard (Norway) and East Greenland (Greenland) and the area between West Greenland and East Canada (both Canada and Greenland). Within each area, however, there might be separate populations (like the seals in Kangia).

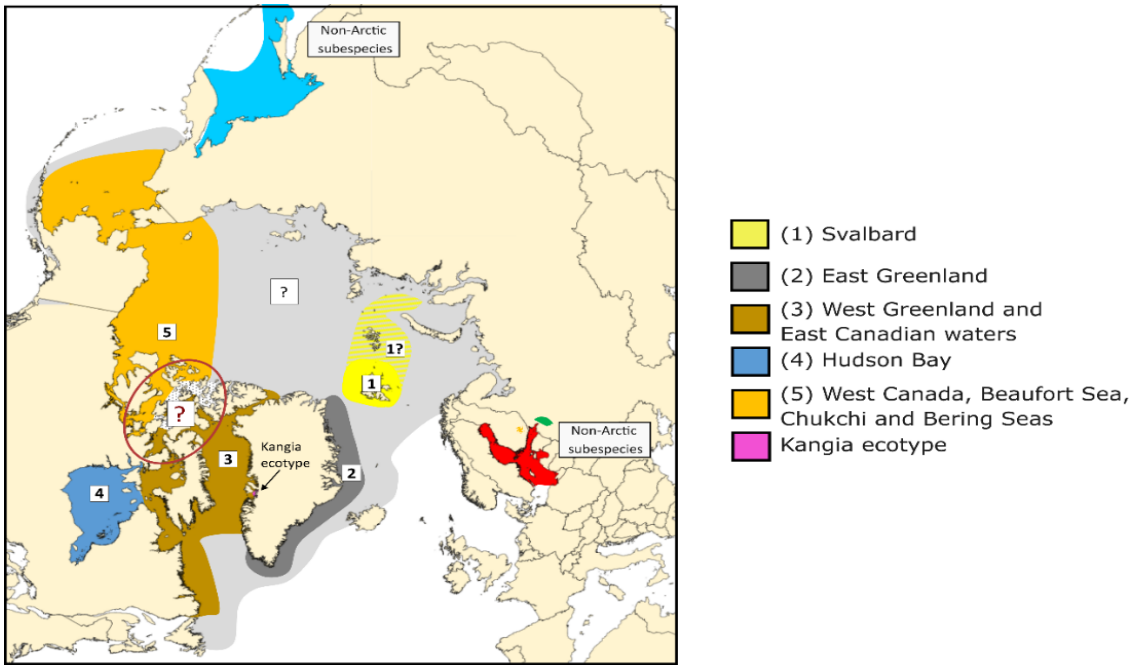

Figure 2. Map showing the five management areas for Arctic ringed seals, and the location of the ecotype from Kangia. The map also shows four non-Arctic subspecies.

ii) To review which data (especially abundance, survey data, and hunting statistics) are available in each management area and iii) define whether there are any areas for which an assessment can be conducted.

Svalbard (Norway): Drone surveys will be conducted to study ringed seal population trends in 2024. Hunting statistics for Svalbard have been available since 2002 and they indicate fewer than 100 ringed seals caught yearly. The WG concluded that it would be possible to make an assessment, but the catch is small (less than 100 animals per year), and it only affects a small area (not the entire population).

East and West Greenland: No recent surveys have been conducted except for a survey in 2018 in Kangia (the habitat of the new ecotype of ringed seal). The estimate was about 3,000 seals. In Greenland all catches are reported by month. Ringed seal catches have declined in both East and West Greenland in the last two decades. The decline during 2005-2021 has been from 74,805 to 27,594 in West and from 16,239 to 7,082 in East Greenland.

No assessment could be made due to lack of abundance estimates. Abundance for the Kangia ringed seal is available for 2018, but the catch statistics don't separate the Kangia ecotype from catches of other Arctic ringed seals. Furthermore, ice conditions in Kangia (which usually protect most of the seals against hunting) have changed in recent years and that is likely to have increased the catches. A new survey is therefore needed for an assessment of the seals in Kangia.

Canada: Eleven surveys have been conducted in Western Hudson Bay since 1995, more recently using infrared cameras. However, results have shown considerable year-to-year variation in abundance estimates, likely related to uncertainties associated with availability variation (the fraction of the seals that haul out on the ice).

In 2016 and 2017, ringed seal aerial surveys using photographic and infrared camera technology were performed in Northern Baffin Island and since 2018, seven surveys using infrared cameras were conducted in the Last Ice Area (the northernmost part of Canada and Greenland, projected to be the last stronghold of summer sea ice if the earth continues to warm due to climate change).

Catch statistics are not collected regularly in Canada.

The surveys in Northern Baffin Island cover a small fraction of the area that would need to be surveyed in order to assess the seals hunted in West Greenland and East Canada.

Alaska: Surveys have been conducted and the results of the first round of surveys are close to being published. Catch statistics are not collected, but rough estimates are made based on household surveys (questionnaires about consumption of various game).

iv) To describe what kind of data are lacking for management areas with insufficient data.
Abundance estimates are lacking for both East and West Greenland as well as for the Kangia population. It is however likely that there are more subpopulations like the Kangia seals that just need to be recognised and described. It is, therefore, important to continue the work of tracking as well as genetic studies.

v) To discuss whether there are alternative methods to carry out abundance surveys for assessing the stock status of ringed seals.
High resolution satellite-images and images from drones, along with automatic image-recognition of seals, might revolutionise abundance estimates in the future and there are several groups working with these methods. The WG however found that aerial surveys using planes is the best available set-up right now, but still the uncertainty related to the correction factor of seals that are submerged remain.

Earlier studies by Kingsley (1998) and Stirling and Øritsland (1995) used polar bear numbers to come up with estimates of the number of ringed seals needed to support them, which would roughly equal the population size in areas where polar bears exclusively were feeding on ringed seals. Such studies can now be refined using "quantitative fatty acid signature analysis" to determine the fraction of various prey species of predators like the polar bear. Several of the group members were however sceptical of these studies, which they found to rely too much on assumptions and uncertainties.

Anthropogenic stressors other than hunting were also discussed. Overall, the WG did not see pollution, disturbance, or by-catch as key anthropogenic stressors for ringed seals in the Arctic. While some areas are experiencing a loss of habitats due to climate change, there are instances of habitat gains in certain regions (e.g., some fjords in Greenland have become longer and areas with multi-year ice have been replaced with annual ice). Declining catches in Canada and Greenland along with an absence of YOY in catches in Svalbard are concerning and might be linked to deteriorating breeding habitat in general (Alaska shows signs of potential stability).

The group expressed strong concerns over the overall circumpolar projections in sea ice decline and changes in precipitation patterns (i.e., increased rain and winds instead of snowfall) that may cause a dramatic loss of ringed seal habitat. The group therefore **recommended** monitoring sea ice conditions to ensure an up-to-date assessment of ringed seal habitat status. Also, the group strongly **recommended** that efforts in monitoring the different populations and assessing their status be increased.

Discussion

The SC **agreed** that the ice situation leading to changes in hunting patterns of the isolated ecotype of ringed seals in the Kangia fjord requires increased monitoring intensity.

Some members of the SC questioned whether genetic isolation, similar to that observed in Kangia seals, occurs in other fjords in Greenland. Rosing-Asvid responded that small- and large-sized adult seals sampled in three different areas have not showed evidence of genetic isolation. However, the study is still ongoing and seals from other fjord systems are being tested.

Concerns about the delineation of management areas were raised during the discussion, as it appeared that some tagged individuals were observed travelling well beyond the management areas in which they were tagged. Given the small sample size, it is not possible to determine if this is a frequent occurrence and, therefore, if the management areas should be redefined. Increasing the sample size

by tagging additional animals, while integrating further genetic information, could offer more comprehensive insights into stock structure.

Rosing-Asvid noted that it is necessary to understand ringed seal stock structure, investigate the presence of separate isolated groups like that of Kangia and, if identified, closely monitor smaller populations. In addition, he suggested that the declining catches in Greenland might be linked to increased pup mortality, something that may be reflected in the sizes of purchased skins.

Regarding acoustic disturbance, it was noted that other species, such as narwhal and beluga, are much more sensitive to noise than ringed seals. Therefore, if there are protections in place for the former, the latter will also be protected by those same anthropogenic noise limits.

The SC noted that the WG did not discuss the original hypothesis that offshore pack ice populations in Baffin Bay and the Greenland Sea could be supplying the coastal ones. The SC **recommended** that this be considered at the next WG meeting.

In response to R-2.3.3, the SC **agreed** that a full-scale assessment cannot be conducted due to the lack of the necessary data stemming primarily from the spatial dispersion of ringed seals, that makes a full-scale aerial survey logistically challenging. Instead, the SC suggested a similar approach for Greenland to that used in Svalbard, in which specific harvested and non-harvested areas are monitored and compared, to assess the sustainability of catches and the effect of climate change. To address this, the SC modified and prioritised seven **recommendations** given by the WG (Box 2). The remaining recommendations of the WG were also **endorsed** (Appendix 7).

Box 2. Recommendations pertaining to Ringed Seals prioritised by SC/30.

Recommendations for Research to All Parties

- To use genetic and telemetry data only from adult ringed seals or nursing pups sampled during the breeding season for population structure studies.
- To monitor the effects of climate change to understand the drivers potentially impacting ringed seals with a focus on sea ice conditions, to ensure an up-to-date assessment of the ringed seal habitat status.
- To conduct partial surveys of ringed seals (as index).
- To ensure that efforts to determine population structure be continued.

Recommendations for Research to Greenland

- To carry out a new survey of the Kangia seals in spring 2024 to get a new abundance estimate and report this to the next SC meeting.
- To monitor selected fjord systems with and without catches to assess the effects of hunting, disturbance, and climate change.

Recommendations for Conservation & Management to Greenland

- To validate catch numbers.

9.2.3. Updates

Rosing-Asvid updated the group on ongoing genetic studies investigating the presence of genetically distinct ringed seals in isolated fjords in Greenland.

Lydersen shared that the analysis of data from drone surveys in Isfjorden (Svalbard) is pending. Additionally, he mentioned that an upcoming paper addressing the sustainability of the harvest in Svalbard is soon to be published.

9.3. HARBOUR AND GREY SEALS

9.3.1. Review and status of active requests (R-2.4.2, R-2.5.2)

R-2.4.2 (2019, ongoing) *asks the SC "to provide a new assessment of grey seal stocks throughout the North Atlantic."*

R-2.5.2 (2014, ongoing) *asks the SC "to conduct a formal assessment of the status of harbour seals in all NAMMCO areas as soon as feasible."*

In response to R-2.4.2 and R-2.5.2, the SC stated the requests were not answered by the WG because of the lack of necessary data (see 9.3.2 below). The SC **suggested** that R-2.4.2 should be reformulated to match the language of R-2.5.2 and specify that *North Atlantic* refers to *NAMMCO areas* in this context.

9.3.2. Coastal Seals Working Group

Kjell. T. Nilssen (Norway) presented the report of the NAMMCO Working Group on Coastal Seals (NAMMCO/SC/30/06), which met in Copenhagen (Denmark) on May 8–11, 2023 and was chaired by Nilssen.

Summary
The ToRs for the meeting were i) To provide a new assessment for grey and harbour seals throughout the North Atlantic; and ii) To provide guidelines for responsible removals from small coastal seal stocks.

The current management units for **Norwegian harbour seals** are defined by county limits. However, **genetic studies** in central Norway suggests differences between north, central, and south areas in Nordland County. Results from genetic analyses of harbour seals along the Norwegian coast will be available in 2024. **Tracking studies** on harbour seals have been conducted in different regions to monitor their movements and foraging areas. Results from tracking in the Oslofjord area indicate that seals move within and between counties, also between colonies in Norway, Sweden, and Denmark. These findings suggest the need to revise the current harbour seal management units in Norwegian Skagerrak, as hunting activities may involve seals from neighbouring counties or even from Sweden or Denmark. Further genetic sampling and analysis in Sweden are also needed to explore the stock identity of seals in Norwegian Skagerrak. Norwegian harbour seals have a diverse diet consisting of about 20 different species of fish, usually small species and young specimens of larger species. They interact with cod and monkfish fisheries in the North and West of Norway. However, Atlantic cod is not a significant prey item.

Harbour seal counts were carried out along the entire mainland Norwegian coast during moult in 1996–1999, 2003–2006, 2008–2015 and 2016–2021. Counts in 2016–2021 resulted in a **minimum estimate of 6,857 harbour seals in Norway**. In 2022, new counts in Norwegian Skagerrak showed that the harbour seal numbers in Østfold, Vestfold, and Telemark had doubled since 2016. This is probably due to both population growth and migrations from Swedish Skagerrak. Ongoing work using mixed models is being conducted to better understand the uncertainties in the survey counts and to develop models for estimating the total population size of harbour seals in Norway.

Harbour seal hunting quotas in Norway have been recommended at a level of 5% of the total counts in each county. In 2010, the Norwegian Parliament approved a target level (TL) of 7,000 harbour seals in Norway, which can be adjusted based on new knowledge. If the counts show numbers below 50% of the TL in a county, the hunt is halted. Since the implementation of the Management plan in 2011, the catches have mostly been below or within the quota levels. From 2006 to 2020, the average yearly **anthropogenic removals** of harbour seals through hunting (394) and by-catch (458) were in total 852 seals. This translates to an average anthropogenic mortality rate of about 10%.

Regular surveys and population estimations **of harbour seals** have been carried out in **Iceland** since 1980. During these surveys, the coastline is covered at least once**. The population declined from 33,000 animals in 1980 to 10,300 in 2020**. Due to this decline, the Icelandic harbour seal population is defined as endangered on the national red list for threatened populations. In 2006, a management objective was put forward, stating that the harbour seal population should be kept above 12,000 animals. However, there is a need for a more thorough management plan, which takes biological parameters and updated research-based knowledge into consideration. In 2019, a new seal hunting regulation was enacted, where all seal hunting in Iceland was banned. Further, the aerial count survey frequency has been increased (biannual surveys). In 2023, Iceland also increased the effort in monitoring by-catch through inspectors. Closures of areas with high by-catch has also been tested, however no results are available yet.

The WG was informed that **growing tourism** causes increased disturbance on harbour seals, both on land and in water, during seal pupping, mating, and moulting periods. The disturbance and management of seal watching activities are currently being monitored in various locations in Iceland.

Harbour seals were hunted to near extinction in **West Greenland**, until a hunting ban was implemented in December 2010. Since then, only three small populations have been identified in places where the seals occur during breeding and moulting periods. Sporadic observations of harbour seals in other areas could indicate that there might be additional unknown small populations. Some of the harbour seal breeding and moulting areas are located on mud-sand deltas, such as in Kangerlussuaq; these areas are easily accessible for seals and the flat open space prevents hunting.

In Majorariaq, harbour seal pupping occurs in a fjord habitat with a very narrow entrance. This breeding area has probably only been known for about 20 years. It is most likely a small remaining group of a much larger population of harbour seals that lived south of Majorariaq.

The southernmost breeding area in Qeqertat is an archipelago. During the pupping season, there might be 1–2 km between individual mother-pup pairs, or small groups of females and their pups. Together they form a cluster (ca. 15x45 km) of breeding females. The moulting area in Qeqertat is a small group of islands (about 1 km^2) in the centre of the breeding cluster. A **tagging study** in 2009–2010 (before the hunting ban), showed that both males and females moulted at Qeqertat and many stayed in the "breeding area" for most of the year. However, prior to the breeding season, some of the tagged seals migrated about 250 km northeast along the Greenland east coast and gave birth in what appears to be another breeding area in Puisortoq.

Harbour seal hunting is currently banned in Greenland, but some harbour seals are shot due to misidentification, and some are taken as by-catch in gill nets.

Grey seal pup counts performed along the Norwegian coast revealed an increase in the grey seal population from the period 2001–2003 to 2006–2008, with an estimated annual pup production of around 1,200 pups. The total **estimated abundance** was 8,740 grey seals (95% CI: 7,320–10,170) in 2011. However, a significant decline in pup production occurred in central Norway (Trøndelag-Nordland counties) from 2014 to 2018, resulting in an estimated total population (including pups) of about 3,850 grey seals in 2018. The decline in pup production has continued in Trøndelag-Nordland until present. In other areas of Norway, pup numbers have increased or remained stable in recent years.

During the period of 2007–2011, a bounty system was introduced by the Norwegian Directory of Fisheries, resulting in increased **seal catches**. However, after the implementation of a management plan for grey seals in 2011, the quotas were reduced to align with seal abundance estimates. When pup production declined by about 50% in 2014–2015 in middle Norway, hunting was stopped in that area.

By-catch in the monkfish fishery is believed to be a significant driver of population declines in middle Norway, which is also the main area for this fishery. Such a decline seems unlikely to be caused by a

lack of food, as potential prey items for grey seals (e.g., cod, saithe, wolffish, and herring) are locally abundant. Despite a regional hunting ban since 2015, by-catch continues to be a concern for the grey seal population. A tagging study showed that all five tagged pups were caught in gillnets shortly after tagging. Reports from the coastal reference fleet also indicate a high level of grey seal by-catch, with an average annual estimate of 363 animals.

Ongoing work involves the development of a grey seal population model that incorporates by-catch estimates and utilises catch data on monkfish as a driver. This research aims to refine understanding of the grey seal population dynamics and the factors that contribute to its fluctuations along the Norwegian coast.

Regular population estimates for **Icelandic grey seals** have been conducted since 1982, with counts carried out during the pupping period in October and November. The latest estimate from 2017 indicates a **population size of 6,300 animals**, showing a decline over the past decades. The population is currently classified as vulnerable on the national red list. A new count was conducted in 2022 and new population estimates are expected in 2023. In 2006, a management objective was established to maintain the Icelandic grey seal population above 4,100 animals, triggering intervention measures if the population drops below this threshold. However, as with harbour seals, there is a need for a more thorough management plan, which takes biological parameters and updated research-based knowledge into consideration. Hunting of grey seals has been minimal since the hunting ban was implemented in 2019. Efforts have been made to increase monitoring of grey seal by-catch through inspectors, and the closure of areas with high by-catch has been tested, although no results are available yet.

The WG was informed that a pilot study using satellite tags on grey seal pups had been conducted in Iceland, aiming to gain insights into the important habitats of grey seals.

Updates were provided on the survey efforts to count **grey seals in the Faroe Islands**, with a minimum estimate of 661 animals based on the highest counts from boat-based surveys conducted in the islands in 2018, 2019, and 2021. The harvest of grey seals, averaging 140 seals per year from 2010 to 2020, has been discontinued due to a new law prohibiting intentional killing around fish farms since January 2021. **Tracking data** from 17 grey seals suggest that seals remain close to the shore and favour specific haul-out sites. Only one seal was tracked outside the Faroese EEZ. This correlates well with genetic data suggesting a separate Faroese stock. There are plans to track more seals and monitor haul-out behaviour using cameras. Based on the current minimum estimate, the population is still below the population level of 3,000 seals estimated in the 1960's. There is currently no management objective for grey seals in the Faroe Islands.

Discussion

In the Faroe Islands, direct contact between grey seals and human activities is limited to fish farms, while by-catch mortality seems insignificant. Since there are no grey seal removals, the population is likely to increase. The interaction between seals and fish farms has not been quantified, among other things because there is little direct interaction due to the introduction of more robust nets. However, Bjarni Mikkelsen (Faroe Islands) clarified that farmers claim that the presence of seals stresses the fish and reduces their appetite. Attempts with acoustic deterrent devices have been ineffective and are not used today. Current plans in the Faroe Islands involve developing and implementing a monitoring program and a management plan.

Following the precautionary approach, the SC deems it necessary to obtain more accurate total estimates of grey seals in the Faroe Islands before considering the effects of removals.

A question arose about why the WG recommended running a Europe-wide population model rather than addressing the stocks separately. Biuw clarified that genetic results suggest a lack of significant isolation between stocks. Migration patterns have also been observed, particularly between the UK and Norway and between the UK and continental Europe.

The SC noted that the WG did not provide information on sustainable removal levels, as many of the seal aggregations appeared to be quite well monitored, noting that Potential Biological Removal can be calculated even for many data poor cases.

The SC **endorsed** all the recommendations given by the CSWG (Appendix 7), and **prioritised** two (Box 3). The SC **recommended** that the ToRs should incorporate a specific point in the future regarding the determination of sustainable levels of removals.

Nilssen stepped down from his position as the Chair of the WG and the SC thanked him for his work as Chair. Granquist was nominated as the new Chair of the CSWG.

Box 3. Recommendations pertaining to Coastal Seals prioritised by SC/30.

Recommendations for Research to All Parties

- To estimate sustainable removal levels for each stock of grey and harbour seals.

Recommendations for Research to Iceland

- To continue efforts to develop population models for both species, assess whether data on biological parameters (e.g., historical population size, changes in carrying capacity over time) from other areas can be used for this, and collect data on biological parameters from Icelandic seals to the extent that it is necessary.

9.3.3. Updates

Sigurðsson informed the SC that a manuscript investigating effects of closures of lumpsucker fishing areas, showing a significant reduction in grey seal by-catch in Icelandic waters, will soon be published. The SC is looking forward to seeing the results of that study.

Granquist conveyed that an informal request from the Ministry of Food, Agriculture, and Fisheries in Iceland has been received for them to present a management plan for grey seals, including sustainable removal levels (NAMMCO/SC/30/FI35). Granquist also noted that the survey planned for 2023 had to be postponed due to financial reasons. A new partial survey is planned for 2024. Until now, the censuses have been based on aerial surveys conducted from small single engine fixed winged airplanes. Due to the high risk of using these airplanes under Icelandic conditions (including factors like harsh weather and challenging topography), Iceland will move away from this method and instead start to use drones. The drone surveys should preferably be complemented with tagging data.

DNA analyses for Norwegian harbour seal stocks are soon to be finalised, and the results are expected to be published in 2024. In Svalbard, a project studying detailed dive data of seals, including harbour seals, is in its final year, with results anticipated in 2025.

Harbour seal populations in Greenland are currently being monitored, and hunters are being interviewed to report by-catch. These interviews may also help identify breeding areas not previously known to scientists. The SC raised concerns that the ban on harbour seals may not be being fully respected, as evidenced by the population not increasing at the expected rate.

9.4. HARP AND HOODED SEALS

9.4.1. Review and status of active requests (R-2.1.2, R-2.1.9, R-2.1.10)

R-2.1.4 (2003, standing) *asks the SC "to regularly update the stock status of North Atlantic harp and hooded seals as new information becomes available."*

R-2.1.9 (2022, ongoing) *asks* the SC *"to investigate possible reasons for the apparent decline of Greenland Sea stock of hooded seals and assess the status of the stock."*

R-2.1.10 (2019, standing) *asks the* SC to *"to provide advice on the total allowable catches for the management of harp seals."*

The SC responded to R-2.1.4 and R-2.1.9 under item 9.4.3. It is currently not possible to answer R-2.1.10, although the SC will continue to examine ways to calculate allowable catches (see item 9.4.3).

9.4.2. Benchmark Workshop for Harp & Hooded Seals

Henden presented the report of the Benchmark Workshop (WS) for Harp & Hooded Seals (NAMMCO/SC/30/13), which met on May 22–26, 2023 in Copenhagen (Denmark) and was co-chaired by Daniel Howell (Institute of Marine Research, Norway) and Alejandro Burren (Argentine Antarctic Institute, Argentina).

Summary

The WS was tasked with evaluating proposed developments to the assessment model used for two stocks of harp seals—East Ice (White Sea/Barents Sea) and West Ice (Greenland Sea)—and one stock of hooded seals—West Ice (Greenland Sea)—in the Northeast Atlantic. The WS concluded that there were sufficient data to produce an assessment model for the West Ice stock of harp seals, but that data were insufficient for the East Ice harp seal stock and with too weak a signal for the West Ice hooded seals for viable assessments of these stocks.

There has been no pup production survey for East Ice harp seals since 2013. Hence, the WS concluded that a viable assessment of current stock status or catch advice cannot be produced until new estimates are provided. The WS recommended that a pup survey and subsequent revised assessment is required prior to the resumption of any substantial commercial hunt.

For the West Ice harp seal stock, the WS proposed a revised assessment model using cod and capelin alongside a first order autocorrelation (AR1) process to drive the model dynamics. The historical modelled population absolute level is uncertain, but the overall recent trend is relatively flat and has not been adversely affected by recent catches.

The WS noted the current low level of the hooded seal stock and that no commercial hunting has been conducted since 2007. No commercial hunting should be considered unless a clear upward trend in the pup abundance estimate can be observed, taking into account the uncertainty in these data. In the event of such an improving trend being observed, a new revised assessment would be needed prior to the resumption of hunting, in order to give information on stock status and potential harvest levels.

The benchmark also performed a preliminary evaluation of the existing catch-at-age data for the different stocks. There were sufficient signals in the data consistent with population structure (exponential decay with age, sign of recruitment failure tracking between years) to consider the possibility for using these data for model tuning. The WS strongly encouraged that such work be furthered.

Discussion

Henden clarified the decision not to use an autoregressive model, noting that while it provides more flexibility, it doesn't contribute additional biological information. The chosen model, without an autoregressive process, introduces less flexibility, but at the expense of a marginally worse fit to the observed pup production data. Henden also explained that the lack of data and the high priors were probably driving the model and that the results may improve following the introduction of the catch-at-age data collected. Limited access to diet/fish data poses a challenge to the model of hooded seals, but it was emphasised that regardless of the kind of prey included, the model fit will likely not be substantially impacted.

9.4.3. Joint Working Group on Harp and Hooded Seals

Biuw presented the report of the Joint Working Group on Harp and Hooded Seals (NAMMCO/SC/30/11), which met on August 21–25, 2023, in Tromsø (Norway) and was co-chaired by Biuw (Norway) and Sophie Smout (University of St Andrews, UK).

Summary
The main objective of the working group was to review recent surveys of Greenland Sea harp and hooded seal pup production and examine harvest scenarios for these populations as well as harp seals in the White Sea. The ToRs were to: i) Review new pup production estimates based on the 2022 surveys of NW Atlantic and Greenland Sea harp seals and Greenland Sea hooded seals; ii) Review results from the biological samples obtained from the NW Atlantic, Greenland Sea and Barents Sea / White Sea stocks; iii) Review the status of populations using the method agreed at the WKBSEALS2023 benchmark as described in the stock annex and produce a report of the work carried out, providing summaries of the following where relevant: a) Input data and examination of data quality; b) estimates of population size, pup production, and harvest potential; c) The state of the population against relevant reference points; iv) Review the main result from WGIBAR (ICES Working Group on the Integrated Assessments of the Barents Sea) and WGIEAGS (ICES Working Group on Integrated Ecosystem Assessment of the Greenland Sea); v) Comment on relevant sections of the published ecosystem and fisheries overviews for the Greenland Sea and the Barents Sea.

No new survey to estimate pup production of Barents Sea/White Sea harp seals was completed. No new survey information was available for the Northwest Atlantic. The **2022 Greenland Sea aerial survey** images were analysed manually and with the aid of automatic detection methodology (deep learning). For assessment purposes, this report only refers to the manual counts. Correction factors based on staging surveys were applied according to established methodology. The 2022 Greenland Sea **pup production estimate for harp seals was 92,769** (CV = 20.2%), which is significantly higher than the 2018 estimate but similar to that based on the 2012 survey. The **hooded seal pup production estimate for 2022 was 13,509** (CV=12.9%), slightly but not significantly higher than the 2018 estimate. Subsequent to the recent benchmark meeting, model development indicated that the model estimates of adult population size for the Greenland Sea population of harp seals is highly sensitive to the standard deviation on the prior for initial population size. The WG therefore concluded that **the current version of the assessment model could not be used to explore harvest scenarios based on estimates of current or projected total population size**. Moreover, given the fact that the estimate of current total population size is unreliable, it also did not allow for robust calculation of Potential Biological removals (PBR). Tentatively, two different approaches are presented that might be used to inform sustainable harvest levels until the model has been further improved and reviewed: 1) an adaptive management approach based on population trends and 2) PBR based on a conservative population estimate that is a simple scaling of the observed levels of pup production, based on plausible values of adult:pup ratios. The Greenland Sea hooded seal population shows continued decline and remains below the Lower Reference Limit despite no hunting since 2007. In a recent review of the status of the Northwest Atlantic harp seal population, model fit to aerial survey estimates of pup production and annual reproductive rates was poor compared to previous assessments, indicating underlying problems relating to model assumptions and/or structure. A new hierarchical Bayesian state-space model was fitted to the same data on pup production, annual fecundity, human removals, and environmental conditions used in the previous assessment to produce annual estimates of pup production and total abundance from 1952–2019. Data on age structure based upon random samples were also included, and the process model incorporated environmental stochasticity and several other improvements. The new model estimates were similar to the previous model through 1990 but then diverged, indicating that the population peaked in 1997 at 6.6 million animals, almost a decade earlier than modelled in previous assessments. After a period of decline due to high catches and poor ice conditions, the new model provides an abundance estimate of 4.7 (95% Credibility Interval (CI) 3.7–5.7) million in 2019, compared to an estimate of 7.6 (95% CI 6.6–8.8) million in the last assessment.

The lower estimates of recent abundance reflect higher and more variable juvenile mortality after 2000 due to a combination of density-dependent and density-independent factors operating on juvenile survival. The new model also suggests a decline in equilibrium abundance (K) levels from 7.6 (95% CI=7.4 to 7.8) million Northwest Atlantic harp seals prior to 2000 to 6.8 (95% CI=6.7 to 6.9) million animals post-2000.

Discussion

Biuw clarified that the harp seal quota is never exhausted and that the catches consistently remain below the quota. However, there are issues in reporting the catches.

The SC discussed the effectiveness of tagging animals, indicating that the hope is to use these data together with satellite images to identify potential unknown pupping grounds. This method could potentially be used to survey bearded seals, too. The purchase of satellites for conducting joint surveys was discussed as a future possibility, but SC members involved in such surveys indicated that they will be using drones for aerial surveys for the time being.

Henden noted that the possibility to sample more demographic data of Norwegian harp seals is being investigated, because the currently available catch-at-age data extends only until 2006. He further acknowledged some challenges in including the catch-at-age data in the seal models due to partly unknown selectivity bias in the harvest data records.

In response to R-2.1.9, the SC **agreed** that the reasons behind the decline in hooded seals in the Greenland Seas remain unresolved and need to be confirmed with data. High levels of PCBs and other contaminants, possibly due to feeding on higher trophic levels, may be impacting the reproductive success of hooded seals. Other contributing factors could be predation from polar bears and killer whales or increased competition with fisheries and environmental changes.

The SC **endorsed** all the recommendations given by the WG (Appendix 7) and prioritised three recommendations (Box 4).

Box 4. Recommendations pertaining to Harp and Hooded Seals prioritised by SC/30.

Recommendations for Research to Norway

- To tag more harp and hooded seals in the Greenland Sea and the Denmark Strait, and to reanalyse satellite tagging data from the past for both species.
- To investigate changes in body conditions of both harp and hooded seals in relation to fishing activity.
- To develop a composite environmental index, including physical and ecosystem parameters.

9.4.4. Updates

Biuw informed the SC that a manuscript on the performance of automated machine learning to detect seal pups in aerial photos is in progress.

9.5. WALRUS

9.5.1. Updates

Responding to the 2022 Disturbance Symposium Recommendations for New Research to Greenland and related to the mining activity in the Wolstenholme Fjord, Fernando Ugarte (Greenland) updated the SC on the status of mining, confirming that it is currently on hold and, therefore, not impacting walruses in the area. Ugarte also mentioned the ongoing collection of telemetry and camera data, with plans for a new survey in the North Water scheduled for spring 2025. The analysis of the survey conducted in 2022 in West Greenland is pending.

In Norway, the analysis of camera surveillance and tracking data is underway, and Lydersen will present some of these results to SC/31.

9.5.2. Plans for Walrus Working Group meeting

The SC **decided** to convene the Walrus Working Group in 2026. This timing aligns with the estimated completion of the analysis of both new and existing datasets, ensuring that the results will be ready for use in an assessment during the WG meeting.

In the absence of new abundance data, the SC concluded that the advice from the 2018 assessment remains valid until the new assessment is carried out in 2026. The SC **agreed** to request survey results and catch data from Canada to be presented at the WG meeting.

10.CETACEAN STOCKS – STATUS AND ADVICE TO THE COUNCIL

10.1. NARWHAL

10.1.1. Review and status of active requests (R-3.4.11)

R-3.4.11 (2008, standing) *asks the SC "to update the assessment of both narwhal and beluga, noting that new data warrant such an exercise".*

The SC's response pertaining to narwhal is given in 10.1.2.

10.1.2. *Ad hoc* Working Group on Narwhal in East Greenland (NEGWG)

Roderick Hobbs presented the points of the report of the *Ad hoc* Working Group on Narwhal in East Greenland (NEGWG) that were relevant to narwhal. The NEGWG met at the Greenland Representation in Copenhagen (Denmark), on December 12–15, 2023. The meeting was chaired by Hobbs (formerly NOAA Alaska Fisheries Science Center, USA).

Summary
The WG was given the ToRs established by Council 30 (2023), namely: i) To update the assessment of narwhals in Southeast Greenland using data from recent surveys; ii) To review the situation of belugas in East Greenland with participants from Norway; iii) To define suitable timeframes for abundance surveys and assessments for each specific case (species/stock).

Following a recommendation from SC/28, the WG proposed a series of definitions related to narwhal and beluga stock size and status and, following those, proposed a **Management Framework** to generate advice for stocks of each status. The definitions and management frameworks are available in Appendix 6.

Range-wide genetic structure of narwhals was examined. Three distinct populations of narwhals were found in a Principal Component Analysis (PCA): Canadian Arctic Archipelago and West Greenland (CAA/WG), Northeast Greenland and Svalbard (NEG/Sv), and Southeast Greenland. Analyses indicate that the three populations diverged less than 10,000 years ago. Very low levels of diversity were found in all three populations, with heterozygosity levels amongst the lowest recorded for any mammal species.

Whole genome re-sequencing was used to assess the **fine-scale genetic structure of narwhals in East Greenland** using 62 unrelated individual samples from all hunting areas between Tasiilaq and Ittoqqortoormiit, and non-hunted areas in Northeast Greenland and Svalbard from various seasons. A PCA found three clusters of narwhals with different levels of distinctness: 1) a Northern cluster (majority consists of individuals from Svalbard, Northeast Greenland, and Scoresby Sound spring), 2) a Scoresby Sound summer cluster (majority consists of individuals found in the summer in Scoresby

Sound), and 3) a Southern cluster (majority consists of individuals from Kuummiut, Sermilik, and south of Sermilik).

The genetic evidence confirms indications from local knowledge, morphology, behavioural, and survey data that there is a clear distinction between animals hunted in spring and summer in Management Area (MA) 1.

Based on the genetic evidence and combined survey and telemetry data from previous years, the WG agreed that there are **two distinct groups of narwhals hunted in Scoresby Sound**, one in spring (January–July) and one in summer (July–December), and, following the precautionary approach, they should be managed separately. The WG recommended that the hunt should be closed in July, when it is not easy to distinguish between the two groups of narwhal.

Following a recommendation from NAMMCO's Scientific Committee**, an aerial survey of** narwhals in the region outside Scoresby Sound was conducted in May 2022. This survey encompassed both the **wintering area of the animals hunted in summer in Scoresby Sound and the potential wintering area of the animals hunted in spring in Scoresby Sound**. The primary objective was to determine whether a supposed northern and a supposed southern stock are spatially distinct and to assess the abundance of narwhals in both areas. During the survey, nine sightings were recorded. The estimated narwhal abundance in the northern area, presumably used by the animals supplying the spring hunt, was 427 (CV = 0.58, 95% CI: 148–1231), while the winter ground of the animals that spend their summers in Scoresby Sound had an estimated abundance of 891 whales (CV = 0.97, 95% CI: 181–4835). The WG agreed that this survey provides an abundance estimate of the proportion of narwhals available for the spring hunt in MA 1, which can be used in a calculation of Potential Biological Removal (PBR).

A wide-ranging survey for narwhals was conducted in Southeast Greenland in August–September 2022. Timing, coverage, and survey design were decided after consultation with hunters from the two communities in Southeast Greenland and hunters also participated in the execution of the survey. A total of 4,564 km were covered under optimal survey conditions and 25 sightings of narwhals were obtained from a total stratum area of ~27,500 km^2. No narwhals were seen south of Kangerlussuaq (MA 3, the Tasiilaq area). The abundance in MA 2 (Kangerlussuaq and Nansen Fjord) was 188 whales (CV = 0.42, 95% CI: 85–417) and the abundance in MA 1 (Scoresby Sound) was 176 whales (CV = 0.68, 95% CI: 53–590). The total abundance was 365 whales (CV = 0.40, 95% CI: 173–769). This is the lowest abundance of narwhals detected for all management units in Southeast Greenland and it underscores serious concerns about the status of these stocks. The abundance estimates presented were deemed suitable for the purposes of stock assessments.

The **annual meat supply** from different large mammals, including narwhal, in East Greenland was estimated from catch statistics and estimated average meat yields. The available meat from marine mammals, polar bears, and muskoxen in East Greenland spanning the period from 1993 to 2021 was assessed. Narwhals consistently contributed around 5–6% of the total annual meat supply throughout the entire period. The argument put forward by the NAMMCO MCC in 2022 regarding the importance of narwhal as a source of food security *per se* has not been used regarding other marine mammal hunts in NAMMCO member countries. Acknowledging caveats surrounding nutritional value and cultural/traditional preferences, the calculations of raw meat quantity available from different large mammals hunted in East Greenland show that narwhal meat is only a small fraction of total meat supply and could be replaced by other sources.

Since 2018, **catches in East Greenland** have been categorised into three Management Areas and two seasons in MA 1. For the five years from 2019 through November 15, 2023, there were total reported catches of 149 animals for MA 1 (Ittoqqortoormiit), 65 for MA 2 (Kangerlussuaq), and 41 for MA 3 (Tasiilaq). Estimated total removals for the same period were 195, 91, and 60 animals in each area, respectively. During 2019-2023, almost all catches in MA 1 occurred after July 1, suggesting the entire hunt was from the Scoresby Sound putative summer stock of narwhals. The WG agreed that the catch statistics as presented are suitable for use in the stock assessment, distinguishing between the spring

and summer management units in Scoresby Sound. Hunting from kayaks was documented in Kangerlussuaq Fjord in 2023, yet no catch records from that period included this method. The observations corroborate low struck and lost rates for the kayak hunt. The WG further recommended that the information on hunting locality and methods be improved.

In 2021, Inatsisartut (the Greenlandic Government) requested that Pinngortitaleriffik (the Greenland Institute of Natural Resources) count narwhals in Southeast Greenland, covering the three Management Areas. Pinngortitaleriffik was tasked with ensuring that the results could be used by NAMMCO to update the advice on sustainability of narwhal hunting. A two-day **workshop between Pinngortitaleriffik and hunters from all towns and settlements in East Greenland** was held in Iceland in June 2022. The aim was to develop a final—agreed upon—proposal for planning that Pinngortitaleriffik could use **to organise a survey**. The hunters' designation of the time for counting, areas for counting, and the weighting of these areas were included in the planning of the survey. Track lines were hand drawn, then digitised, and during the survey, all transects were flown as planned on the agreed-upon dates. Data on the distribution and number of narwhals were collected through a systematic aerial survey, allowing narwhal abundance to be used in assessment models of narwhal stocks. Post-survey meetings were held between hunters and Pinngortitaleriffik during summer and fall 2023. The general conclusion from the meetings was that hunters and researchers appreciated the exchange of knowledge and that there was a respectful collaboration throughout the process. There was an agreement that cooperation reduces misunderstandings and increases mutual understanding, trust, and respect and that there is satisfaction in allowing for disagreements as it lays the groundwork for greater cooperation moving forward. The group recommended sharing knowledge as beneficial for both hunters and researchers. The hunters, however, did not accept the abundance estimate of the survey, but there was consensus that there has been a decline in the number of narwhals (in the summer months) over the past 50 years south of Kangerlussuaq to and including Skjoldungen and similarly during the last 10 years in Scoresby Sound/Hjørnedal. According to researchers, the main cause of the decline in distribution (area usage) and the number of narwhals in Southeast Greenland is overharvesting, while hunters believe it is mainly due to climate change and anthropogenic disturbance from large vessels (such as cruise ships). The WG commended the efforts made to conduct this exercise and expressed their gratitude to the hunters for their active participation throughout. It was agreed that this survey design and implementation was a good application of the recommendation for collaboration with hunters and that efforts should be made to replicate it when possible.

Population dynamic models for narwhal MA1 (summer), MA2, and MA3 are summarised here. Catch quotas were released by Greenland for 2024 in mid-December 2023, and these are used here.

The **assessment of the East Greenland summer aggregation of narwhals in Scoresby Sound (MA 1)** used a population dynamic model that included three absolute and three relative abundance estimates, an age-structure of 119 individuals, the age of maturity of six females, an observed deteriorating birth rate, and an updated history of total removals starting in 1955. It is concluded that *the stock is depleted, declining, and immediately threatened by unsustainable hunting*. There currently remains only 11% (depletion level) of the original stock of 1,570 (90% CI:1,180–1,910) narwhals from 1955. The 2022 abundance estimate is approximately half of the estimate from 2016. One third (i.e., 71 individuals) of the 2022 point estimate (214 narwhals) was removed by the hunt in 2022 and 2023. Resulting in an assessment projection estimate of 173 (90% CI:67–314) narwhals remaining in 2024. If annual catches continue at the 2024 quota-level, there is 90% risk that the stock will become near extirpated by 2030 (falling below 100 individuals). This risk is reduced to 24% if no narwhals are taken (Table 3; Figure 3).

Table 3. Probability that abundance will drop below 100 individuals between now and 2030, given different levels of total removals (R).

R	2025	2026	2027	2028	2029	2030
22	0.24	0.39	0.58	0.77	0.85	0.90
20	0.24	0.37	0.54	0.73	0.83	0.88
15	0.22	0.29	0.44	0.60	0.75	0.83
10	0.21	0.25	0.30	0.44	0.55	0.66
5	0.19	0.23	0.26	0.30	0.40	0.48
0	0.17	0.18	0.20	0.22	0.22	**0.24**

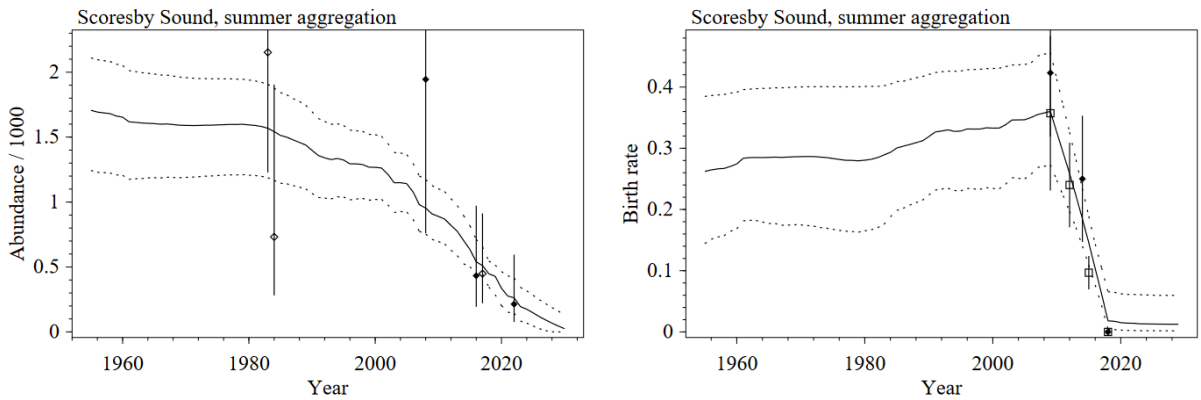

Figure 3. Projected medians and 90% credibility intervals of narwhal abundance and birth rates in Management Area 1, based on the best-fitting population assessment model.

The age-structured **assessment model of the summer aggregation of narwhals around Kangerlussuaq and within 67°00'N to 68°30'N (MA 2)**, included an updated catch history, demographic variation, and a new 2022 estimate of abundance. A density regulated model estimates a substantial decline, from a pre-exploitation abundance of 1,150 (90% CI:774–1,630) animals in 1955, to a small and depleted stock of 138 (90% CI:72–231; depletion level: 12%) remaining in 2024. *The stock continues to decline, and it is immediately threatened by an unsustainable hunt.* The projected decline after 2008 is consistent with estimates from the assessment model of 11% emigration and 11% underreporting. Stock status is relatively unaffected by this uncertainty, with the model estimating 90% risk of near extirpation by 2030 (decline below 100 individuals) if annual removals continue at the 2024 quota-level. This risk is reduced to 15% if no narwhals are taken (Table 4; Figure 4).

Table 4. Probability that abundance will drop below 100 individuals between now and 2030, given different levels of total removals (R).

R	2025	2026	2027	2028	2029	2030
22	0.34	0.51	0.66	0.77	0.85	0.90
20	0.32	0.48	0.62	0.73	0.81	0.87
15	0.28	0.39	0.49	0.59	0.68	0.74
10	0.25	0.31	0.39	0.46	0.52	0.58
5	0.22	0.24	0.27	0.29	0.31	0.33
0	0.17	0.17	0.16	0.16	0.15	**0.15**

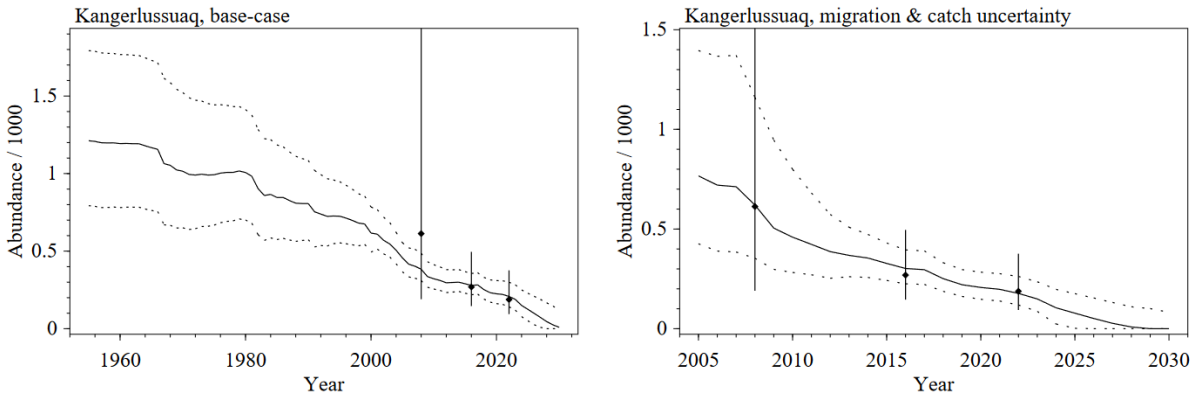

Figure 4. Projected medians and 90% credibility intervals of narwhal abundance in Management Area 2, based on abundance estimates alone and when incorporating correction factors for emigration and underreporting of catches.

The age-structured population dynamic **assessment model of the summer aggregation of narwhals in the Tasiilaq area south of 67°00'N (MA 3)** included demographic variation, an updated catch history, and two zero estimates of abundance from 2016 and 2022. With estimated local removals increasing to an average of 24 narwhals per year from 1980 to 2020, the aggregation declined almost continuously from 769 (90% CI:575–1,110) individuals in 1955 to an estimated abundance of only 3 (90% CI:0–65; depletion level: 0.4%)) narwhals in 2024 (Figure 5). *The stock is Near Extirpated from a sustainable management point of view.* A few individuals may still be found in the area, but it is estimated that there is 91% risk that the stock will be extirpated (extinct) by 2030 if annual catches continue at the 2024 quota-level. This risk is reduced to 33% if no narwhals are taken (Table 5). Any hope for stock recovery and a future sustained stock in the area requires an immediate cessation of removals.

Table 5. Probability that there will be no individuals left between now and 2030, given different levels of total removals (R).

R	2025	2026	2027	2028	2029	2030
15	0.60	0.76	0.85	0.90	0.93	0.95
11	0.57	0.71	0.80	0.86	0.89	0.91
7	0.53	0.64	0.71	0.77	0.82	0.85
3	0.47	0.54	0.59	0.62	0.66	0.69
0	0.32	0.32	0.33	0.33	0.33	**0.33**

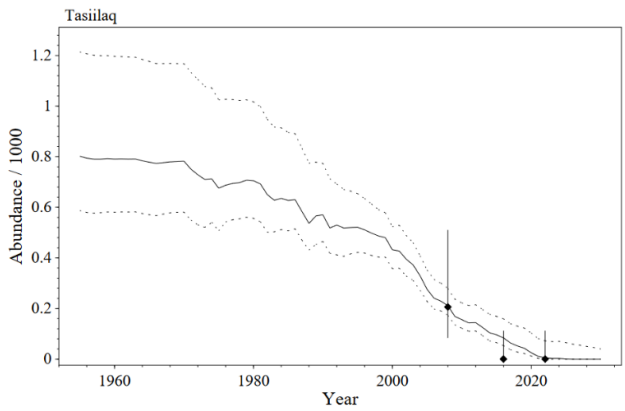

Figure 5. Projected medians and 90% credibility intervals of narwhal abundance in Management Area 3.

Genetic evidence shows that the **narwhals supplying the spring hunt (January 1 to June 30) in MA 1** are related to animals in Northeast Greenland and distinct from the animals taken in the summer hunt within the Scoresby Sound Fjord. However, the summer aggregation(s) and abundance of the animals supplying the spring hunt are uncertain. Available information suggests that the spring hunt is supplied partially or fully by animals detected during surveys east of Liverpool Land. For this area, the abundance estimate is 427 (CV = 0.58, 95% CI: 148–1231) individuals, supporting the designation of this management unit's status as small. From this estimate, we calculate with 80% certainty that the number of animals is above 271, which does not meet the threshold of 300 outlined in the management framework under Item 5.3. Therefore, the WG recommends zero removals, which is also consistent with a Potential Biological Removal approach.

The WG **agreed** that further research could inform about the ranging patterns and relatedness of the animals supplying the spring hunt.

Genetic evidence supports that the **narwhals supplying the summer hunt (July 1 to December 31) in MA 1** are a distinct unit (item 2, NEGWG/09). The aerial survey estimates in 2022 of 176 (CV=0.68) indicate a continued decline in the number of narwhals summering in Scoresby Sound (NEGWG/12) compared to previous estimates, e.g., the estimate in 2016 of 433 (CV=0.49). An assessment model using all information on abundance, removal rates, and life history parameters indicates that continued removals at any level are not sustainable. This is a small stock at risk of extirpation. Therefore, the WG recommends zero removals and immediate closure of the hunt, which reiterates the advice from the two previous assessments.

The WG agreed that, in order to continue monitoring this stock, suitable survey methods should be defined. While region-wide surveys were no longer considered feasible, monitoring should be conducted in a manner comparable to existing survey methods. Thus, a targeted aerial survey of southern Scoresby Sound is the only viable option in the near term.

In light of the quota of 17 landed narwhals allocated by the Greenlandic Government for 2024, the WG **recommends** a new assessment be completed no later than 2026, to which end a targeted aerial survey of southern Scoresby Sound and any other documented aggregation areas be conducted in the summer of 2026.

Genetic evidence shows that the **narwhals supplying the hunt in MA 2** may have a complex population structure (Item 2, NEGWG/09). The aerial survey estimates in 2022 of 188 (CV=0.42) indicate a continued decline in the number of narwhals (NEGWG/12) in the area compared to previous estimates, e.g., the estimate in 2016 of 269 (CV=0.37). An assessment model using all information on abundance, removal rates, and life history parameters indicates that this stock is near extirpated and continued removals at any level are not sustainable. Therefore, the WG recommends zero removals and immediate closure of the hunt, which reiterates the advice from the two previous assessments.

The WG agreed that, in order to continue monitoring this stock, suitable survey methods should be defined. As for MA 1, a targeted aerial survey of Kangerlussuaq and Nansen Fjord is the most appropriate monitoring option in the near term. In light of the quota of 16 landed narwhals allocated by the Greenlandic Government for 2024, the WG recommends a new assessment be completed in 2026 and a targeted aerial survey of Kangerlussuaq, Nansen Fjord, and any other documented aggregation areas be conducted in the summer of 2026.

Aerial surveys in 2016 and 2022 resulted in an estimate of zero **narwhals in MA 3**, acknowledging that the density of animals is too low to be reliably enumerated with this method. An assessment model which incorporated this uncertainty estimates that the current abundance is 3 (90% CI: 0–82) individuals. These estimates classify the stock as near extirpated (<100 individuals) and removals at any level will drive the stock to extinction. Therefore, the WG recommends zero removals and immediate closure of the hunt and additional management measures to reduce or eliminate other

potential sources of lethal and sublethal takes when identified. This reiterates the advice from the two previous assessments.

In light of the quota of 8 landed narwhals allocated by the Greenlandic Government for 2024, the WG recommends a new assessment be completed in 2026. The WG agreed that reports of sightings from local residents and tourists could inform on the presence of narwhals.

Discussion

The SC approves of the drafted stock status definitions and management framework for monodontids, noting that the JWG can further revise these if necessary.

The SC noted that the abundance estimate resulting from the collaboratively planned and executed aerial survey of Southeast Greenland was not agreed on by the hunters, despite the methods having been previously approved by all participants.

The SC acknowledges the high economic value of narwhal mattak and tusks and agreed with and highlighted the presented calculation that narwhal meat provides <6% by weight to the total supply of meat from hunted mammals in East Greenland.

The SC debated the usefulness of a new assessment in 2026, considering that there is no likelihood of any narwhal stocks in Southeast Greenland having recovered to a threshold that might allow sustainable removals within three years.

Based on the robust and detailed evidence of an immediate extirpation risk, the SC **endorsed** the WG's recommendations (Appendix 7) and **strongly reiterated** the recommendation for zero catches in all three Management Areas (Box 5). The SC also **requests** guidance from the MCC on the need for continued monitoring and new assessments.

Box 5. Recommendations pertaining to Narwhal prioritised by SC/30.

Recommendations for Conservation & Management to Greenland

- For all three Management Areas, the SC ***strongly reiterates*** the recommendation for zero removals and immediate closure of the hunt.

10.1.3. Updates

There were no further updates on narwhal research presented.

10.2. BELUGA

10.2.1. Review and status of active requests (R-3.4.11)

R-3.4.11 (2008, standing) *asks the SC "to update the assessment of both narwhal and beluga, noting that new data warrant such an exercise".*

Regarding beluga, the SC **request** further guidance from the MCC (see next item).

10.2.2. *Ad hoc* Working Group on Narwhal in East Greenland

Hobbs presented the points of the NEGWG report that were relevant to beluga.

Summary

Two points of the WG meeting ToRs related to belugas: i) To review the situation of belugas in East Greenland with participants from Norway; ii) To define suitable timeframes for abundance surveys and assessments.

Genetic samples of 15 belugas collected in East Greenland between 2017 and 2023 were compared to a range-wide genomic reference dataset of 75 individuals, which included representative individuals from the majority of recognised beluga stocks. Principle Component Analysis and other analyses

indicated that the 15 beluga samples collected in East Greenland between 2017 and 2023 originated from three different populations, one from Svalbard, nine from the Kara Sea, and five from the Beaufort Sea.

Beluga **sightings and removals** have been irregular and unpredictable in East Greenland. However, there is a confirmed increase in catches after 2017, reflecting a substantial increase in their overall presence in the area. This coincides with the invasive westward spread of pink salmon across the North Atlantic and tributaries in northern Europe and now East Greenland, which could be a new prey item that belugas are following.

The cumulative **beluga catches** for 2022 and 2023 in East Greenland were 33 animals, a record for the area. There is currently insufficient information to determine or quantify other anthropogenic impacts on belugas in this region.

No pregnant females or calves have been reported in East Greenland to date, and there is no information on annual patterns of behaviour or migration. **These animals have not yet established a permanent population in East Greenland**, nor is it known why they appear to be moving into this new habitat in recent years. Whether or not the belugas occurring there are vagrants or in the process of establishing a new population, it is precautionary to treat the animals as a small aggregation of unknown size, with no removals until more information becomes available.

No survey is recommended, because the numbers are too small and the distribution too variable for a survey to provide a robust estimate.

Discussion

Regarding the occurrence of beluga catches in East Greenland prior to 2017, it is the consensus that most of these records are dubious. The recent catch records are considered more reliable and show a sudden increase in the number of beluga catches in the region.

The SC appreciated that the invited Canadian experts attended the NEGWG in person. The SC **endorsed** two of the WG's recommendations for research and conservation (Box 6). The committee **requested** further guidance from the MCC regarding future assessments of these animals, given that they cannot yet be considered a stock and there are no data on behaviour and movement parameters from which to draw useful conclusions.

Box 6. Recommendations pertaining to Belugas in East Greenland prioritised by SC/30.

Recommendations for Research to Greenland

- Collect incidental observations and biological samples when available, to monitor the occurrence of belugas in East Greenland.

Recommendations pertaining to Sustainable Removals in Greenland

- Zero removals should be allowed, in order to allow for the potential establishment of a new population of belugas in East Greenland, and to avoid removing animals that have potentially originated from the small and protected Svalbard stock.

10.2.3. Updates

Lydersen mentioned that the Norwegian Polar Institute has a passive acoustic monitoring device on the continental shelf of Northeast Greenland, which could potentially detect beluga occurrence in this area where there have been no visual detections of the species.

10.2.4. Plans for Joint NAMMCO-JCNB Working Group

The Joint NAMMCO-JCNB WG meeting is likely to be postponed until 2025, therefore this point was not discussed.

10.3. HARBOUR PORPOISE

10.3.1. Review and status of active requests (R-3.10.1)

R-3.10.1 (2019, ongoing) *asks the SC "to perform an assessment [of harbour porpoise throughout its range], which might include distribution and abundance, stock identity, biological parameters, ecological interaction, pollutants, removals and sustainability of removals."*

Mikkelsen reminded the group that the assessment conducted for the Norwegian stock of harbour porpoise in 2022 (NAMMCO/SC/30/FI31) concluded that the by-catch levels are at or above the maximum sustainable threshold. The recommendations put forward by the Harbour Porpoise Working Group at the time are progressing.

The SC considers the assessment for Iceland to be of high priority, and **recommends** that data on biological parameters be collected. Given that the aerial survey that had been planned for 2023 has been postponed to 2025 at the earliest, there will be no abundance estimate available until 2026. It is likely that more data will be available from Greenland by that time, as well, therefore an assessment for all countries could be undertaken that year.

10.3.2. Updates

Two recent publications on harbour porpoises were presented, including NAMMCO/SC/30/FI22 and NAMMCO/SC/30/FI23. The first is a genome-wide analysis across the North Atlantic, and the second investigates the relationship between harbour porpoises and capelin in Icelandic waters.

10.4. DOLPHINS

10.4.1. Review and status of active requests (R-3.9.6)

Request ***R-3.9.6 (2019, pending)*** *asks the SC "to carry out assessments of Tursiops and Lagenorhynchus spp.".*

This request has been answered with regards to *Lagenorhynchus* dolphins, as an assessment was carried out by the Working Group on Dolphins in 2023 (see next item).

10.4.2. Working Group on Dolphins

Nils Øien (Norway) presented the report of the first meeting of the NAMMCO Working Group on Dolphins (DWG), which met in Copenhagen (Denmark) on October 30–November 2, 2023. The meeting was chaired by Philip Hammond (University of St Andrews, UK).

<u>Summary</u>
The Terms of Reference for this meeting were: i) Assess the sustainability of the removals of *Lagenorhynchus* dolphins in the Faroe Islands, Iceland, and Greenland; ii) Review available information in other areas and identify knowledge gaps and needs for further research; iii) Assess impacts from non-hunting related anthropogenic stresses (pollution, climate change, noise etc.); iv) Recommend the suitable regularity of abundance surveys and assessments for each specific case (species/stock).

The main outcomes from the discussions in the DWG are summarised here by the two relevant species, white-sided and white-beaked dolphins.

White-sided dolphins: Extensive genetic evidence indicates that there is **no population structure** across the entire Northeast Atlantic, suggesting that a highly connected (panmictic) population of white-sided dolphins inhabits the waters of the central and eastern North Atlantic. Tagging of white-sided dolphins in the Faroe Islands provides further support for this and the DWG therefore agreed to consider the entire central and eastern North Atlantic as a single assessment unit.

Information on **biological parameters** such as age, growth, and reproduction of white-sided dolphins was derived from data collected from animals taken in the traditional drive hunt in the Faroe Islands over several years. Median ages at sexual maturity were 5.6 years (at length 206 cm) for females and 5.6 years (at length 231 cm) for males. The annual pregnancy rate was 0.23, giving a calving interval of 4.4 years. Parturition likely occurs shortly after midsummer. The DWG noted an under-representation of young animals (up to age 2) and older females in the dataset, which could result from underreporting, not targeting those animals during drives, or from these cohorts not being available to the drive hunt.

Abundance estimates of white-sided dolphins have been compiled from recent surveys in the central and eastern North Atlantic (NASS, SCANS, CODA, ObSERVE). Estimates for the central and eastern North Atlantic assessment unit for 2007 and 2015/16 were generated by summing estimates from European waters from 2007 and 2015/2016 to those from Iceland and Faroes NASS in 2007 and 2015. Although several possible biases in estimates were identified, the DWG agreed that the available abundance estimates were acceptable for use in their assessments.

The Faroese drive hunt provides **catch statistics** dating back to 1872, but the WG agreed that the data cannot be considered reliable prior to 1986. Catches have increased during the last 40 years, accounting for 72% of all recorded catches. The largest harvests occurred between 1993 and 2006, averaging 356 animals per year; subsequently, the annual average has dropped to 122 dolphins. There was one exceptional drive event in 2021 that landed 1,423 dolphins. Group size has fluctuated considerably, but most drives (74%) have recorded groups of 50 animals or fewer. High season is July–October, with drives peaking in September. However, the worse weather conditions during winter months somewhat confound any evidence of seasonal movements within and around the area.

Prior to 2021, **hunting records from Greenland** did not distinguish between white-sided and white-beaked dolphins, as both species had the same common name. However, given the lack of white-sided dolphin sightings during Greenlandic surveys and their almost complete absence from sampled catches, it is presumed that all or most records refer to white-beaked dolphins.

By-catch of white-sided dolphins has not been documented in Icelandic fisheries (except for three individuals that were identified during genetic analysis). In Norwegian fisheries, by-catch records seldom distinguish between the two *Lagenorhynchus* species, so it is difficult to estimate separate by-catch levels for each; however, as for Greenland, it is assumed that all or most records refer to white-beaked dolphins, particularly in northern Norway.

There is limited information on the impacts of **anthropogenic stressors** on white-sided dolphins, with indications that they have high concentrations of Persistent Organic Pollutants.

The DWG used a Bayesian age-structured modelling framework to assess the **sustainability of removals** of white-sided dolphins. The models integrated abundance estimates for the Faroe Islands and Iceland, as well as age structure, survival, and reproductive parameters estimated from the Faroese catch data. A conservative model included only abundance estimates from NASS surveys, while a further model also incorporated estimates from concurrent SCANS, CODA, and ObSERVE surveys in European waters. The conservative assessment model indicates a **maximum removal of 750 animals per year to maintain a 70% likelihood of sustainable catches** in the Faroe Islands (Table 6). The WG noted that, apart from the unusually large catch in 2021, all recent annual drive records have been below 750 animals.

The DWG **recommended** that based on the conservative assessment model, the most precautionary approach for sustainable catches is to maintain the Faroese catch levels below 750 animals per year. The DWG further recommended several research activities be continued to increase knowledge about biological parameters, strandings, by-catches, movements, and dive data to allow for correcting availability in aerial surveys.

Table 6. Catch objective trade-off per stock. The annual total removals per stock that meet given probabilities (P) of meeting management objectives. The simulated period is from 2024 to 2029, and *F* is the assumed fraction of females in the catch. Model rs was run only for the Faroese/Icelandic area covered by two NASS surveys (conservative model); model rl included an extended area covered by non-NASS surveys.

P	*F*	**0.50**	**0.55**	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**
rs	0.50	1121	1020	923	836	**750**	666	599	530	439	336
rl	0.50	1285	1187	1109	1031	**953**	875	790	704	615	483

White-beaked dolphins: Genomic data **indicate population structure** in white-beaked dolphins in the central and eastern North Atlantic, with one stock comprising animals from Iceland and northern Norway and a second stock spanning the North Sea, Britain, and Ireland. The stock identity of Greenlandic animals is unclear due to a lack of genetic or other information.

There is little information available on **biological parameters** of white-beaked dolphins. Data from animals by-caught in Icelandic fisheries and landings in Greenlandic hunts will be processed prior to a future assessment of this species.

Observations from **sighting surveys** show a continuous distribution of white-beaked dolphins from Iceland to Greenland but with a clear hiatus in distribution between northern Norway and Iceland. **Abundance estimates** are available from these surveys. Abundance estimates from aerial surveys around Greenland and Iceland were updated using a correction factor for perception and availability bias derived from SCANS surveys. Because of the clear hiatus in white-beaked dolphin distribution between northern Norway and Iceland, *eastern North Atlantic estimates were not included* in the assessments of sustainability of white-beaked dolphin removals in the Faroe Islands, Iceland, and Greenland.

Dolphin **catches in Greenland** fluctuate annually, ranging from tens of animals to 381 caught in 2020. The majority of catches are taken in Maniitsoq, West Greenland. Catches in Tasiilaq, Southeast Greenland, have increased in recent years. There is considerable uncertainty around the total removal numbers due to unreported landings and animals that are struck and lost. For assessment purposes, and acknowledging the uncertainty around the available information, the DWG corrected the reported catches by two factors: a multiplier of 2.42 for *underreporting*, based on a known ratio of sampled/reported catches from Tasiilaq in 2016, and a multiplier of 3.5 for *struck and lost animals*, estimated from a video of a hunt in Nuuk in 2020.

Data from **Icelandic fisheries** indicate an average annual **by-catch** of 18 *Lagenorhynchus*, which have consistently been recorded as white-beaked dolphins. However, in light of genetic evidence that white-sided dolphins occasionally also become by-caught in this area, these numbers should be reassessed. Data from **Norwegian fisheries**, dating back to 2006, indicate similarly low levels of *Lagenorhynchus* **by-catch**. Although these records are generally not separated by species, observations from sighting surveys suggest that all by-catches occurring in northern Norway can be assigned to white-beaked dolphins, while in southern Norway they likely pertain to both species. Any issues with underreporting and drop-outs from fishing gear should be addressed before extrapolating to the entire fishing fleet.

Information on **anthropogenic impacts** on white-beaked dolphins is limited, but similar to that presented for white-sided dolphins.

Given the uncertainty around removal levels and stock identity of East and West Greenland white-beaked dolphins, the DWG could not perform a full assessment, nor provide advice on sustainable removals. Instead, the DWG conducted a simple preliminary assessment based on *Potential Biological Removal (**PBR**)* applied to two assessment scenarios: i) West Greenland assessed separately from East Greenland, Iceland and the Faroe Islands combined, and ii) Greenland (East and West), Iceland, and

the Faroe Islands combined. In areas that included West Greenland, total estimated removals exceeded PBR; in West Greenland assessed separately, even the uncorrected reported catches exceeded PBR (Table 7). Acknowledging the large gaps in information, these calculations illustrate that the **removals of white-beaked dolphins in Greenland may not be sustainable**.

Table 7. Potential Biological Removal (PBR), and removal values in number of animals for white-beaked dolphin in Greenland (GL) and Iceland (IS). 95% confidence intervals for IS estimates in brackets. S&L is struck and lost animals.

	Scenario (i)		**Scenario (ii)**
	West Greenland	**East Greenland, Iceland, Faroe Islands**	**West Greenland, East Greenland, Iceland, Faroe Islands**
Survey year	2015	2015–2016	2015–2016
PBR	**31**	**1,621**	**1,662**
GL average annual reported catch (2019–2021)	262	50	312
GL reported catch corrected for underreporting (×2.42)	634	121	755
GL reported catch corrected for S&L (×3.5)	917	175	1,092
GL total estimated annual catch (corrected for S&L and underreporting)	2,219	424	2,643
IS estimated annual by-catch (2016–2019)	NA	18 (3–44)	18 (3–44)
Total removals	**2,219**	**442**	**2,661**
Sustainable removals (<PBR)	**No**	**Yes**	**No**

The DWG recommended that high priority should be given to conducting a full assessment of white-beaked dolphins based on accurate and reliable data since the preliminary assessment of white-beaked dolphins revealed that catches of this species in Greenland may not be sustainable. The DWG strongly recommended that Greenland validate the accuracy of reported dolphin removals, implement a system ensuring that underreporting is minimized and can be estimated and evaluate the struck and lost rate for the hunt of dolphins. The DWG further recommended several research activities be continued to expand knowledge of life history parameters, population structure, by-catches, and movements and dispersion.

Discussion

Regarding the absence of certain age cohorts in the white-sided dolphin data, Mikkelsen confirmed plans to investigate stranded individuals in areas south of the Faroe Islands, to determine whether these age classes are present in those areas. Satellite tagging efforts will also be continued. Further, more effort will be made to count all individuals caught in drives, including the youngest and smallest individuals, which may not be recorded.

Based on the current genetic and telemetry evidence presented (showing a complete lack of stock structure), the SC **propose** that the three Management Areas for white-sided dolphins currently defined by NAMMCO be merged into a single one, the Central North Atlantic.

Regarding white-beaked dolphins, Øien informed that further inspection of visual survey data in the Norwegian part of the North Sea revealed that 95% of *Lagenorhynchus* sightings were of white-beaked dolphins and only 5% of white-sided dolphins.

Based on the current (if somewhat limited) genetic information on stock identity and the spatial distribution of sightings, the SC **proposed** that the Management Areas for white-beaked dolphins be redefined as: i) West Greenland and Western Atlantic (provisional; pending genetic confirmation) ii) East Greenland and Iceland iii) Northern Norway and Svalbard and iv) Southern Norway and North Sea.

The SC **agreed** with the conclusion of the WG that removals of white-beaked dolphins could be unsustainable, and that, although the available data are limited, they indicate very high struck and lost rates. The SC **endorsed** all the recommendations of the DWG (Appendix 7) and prioritized four (Box 7), clarifying that the sustainable removals of white-sided dolphins include both catch and by-catch across the entire area assessed, not only the Faroe Islands.

Box 7. Recommendations pertaining to *Lagenorhynchus* dolphins, prioritised by SC/30.

Recommendations for Conservation & Management to Greenland

- To validate the Greenlandic removals with a special focus on minimising underreporting and estimating struck and lost rates, thus facilitating a full assessment of white-beaked dolphins as soon as possible *(high priority)*.

Recommendations for Conservation & Management to the Faroe Islands

- To validate the completeness of the Faroese white-sided dolphin catches, focusing on the apparent lack of juveniles in the catch.

Recommendations pertaining to Sustainable Removals

- To maintain *total removals* below 750 white-sided dolphins per year across Greenland, Iceland, and the Faroe Islands.

Recommendations for Research to Greenland

- To determine the stock identity of white-beaked dolphins in West Greenland, using increased genetic sampling and tagging efforts in Greenland.

10.4.3. Updates

There were no further research updates presented on any dolphin species.

10.5. PILOT WHALE

10.5.1. Review and status of active requests (R-3.8.6)

R-3.8.6 (2011, ongoing) *asks the SC "to continue work to complete a full assessment of pilot whales in the North Atlantic and provide advice on the sustainability of catches, as soon as necessary further information becomes available, with particular emphasis on the Faroese area and East and West Greenland."*

The SC aims to conduct this assessment during 2025, when abundance estimates from the NASS 2024 surveys will be available (see item 10.5.3).

10.5.2. Updates

There were no new research updates presented for pilot whales.

10.5.3. Data availability for next Working Group meeting

Plans for the next meeting of the Pilot Whale Working Group were briefly discussed and suggestions for a Chair and invited experts were put forward.

In 2022, the HPWG had made specific recommendations to the Faroe Islands prior to an assessment of pilot whales, namely, to analyse 150+ teeth samples and reproductive data, to collect and analyse genetic samples together with Iceland and Greenland, and to investigate the potential relationship between pollutants and life history parameters of pilot whales in different sampling periods (FI31). Mikkelsen informed that the collection and analysis of biological samples, as well as tracking data, is in progress, but that genetic analyses are progressing too slowly. The SC **recommended** that the Working Group on Genetics provide guidance on the most appropriate analytical methods (see item 13.1).

10.6. NORTHERN BOTTLENOSE WHALE

10.6.1. Review and status of active requests (R-1.7.11)

R-1.7.11 (2019, ongoing) *asks the SC "to develop estimates of abundance and trends [of northern bottlenose whales] as soon as possible once the [NASS 2015] survey has been completed."*

This estimate has not yet been completed, pending analyses that Norway promised to deliver. The SC **agreed** that a review of northern bottlenose whales could be conducted at SC/31 and that all members with pertinent data should provide it prior to that meeting.

The SC discussed the usefulness of conducting assessment of species undergoing limited or no removals, such as bottlenose whales. The SC noted that a priority for Greenland should be to validate the reported catches of this species, as there appears to be misreporting.

10.6.2. Updates

There were no further research updates presented on northern bottlenose whales.

10.7. BEAKED WHALES — UPDATES

There were no research updates presented to the SC on the topic of beaked whales.

10.8. BLUE WHALE — UPDATES

Lydersen informed of a recent genomic analysis of blue whales in the North Atlantic (NAMMCO/SC/30/FI25) showing gene flow from west to east and unidirectional introgression from fin whales to blue whales in present day samples.

Pastene mentioned that a similar analysis on Southern Hemisphere and North Pacific blue whales is soon to be published; preliminary results show no evidence of interbreeding with fin whales.

10.9. BOWHEAD WHALE — UPDATES

Rikke Guldborg Hansen (Greenland) mentioned that the recent aerial survey of the wintering grounds of Scoresby Sound narwhal recorded two bowhead whales, each with a newborn calf. A new abundance estimate of 888 whales (CV = 0.46) for the West Greenland Feeding Area was presented to and endorsed by the IWC.

Lydersen informed that passive acoustic monitoring in the Svalbard Archipelago revealed bowhead whale presence from November to mid-summer and also narwhal presence in the area during the periods it was covered with drift-ice (NAMMCO/SC/30/FI26).

10.10. COMMON MINKE WHALE — UPDATES

Biuw informed that the Norwegian military had finally been successful in developing an audiogram from live-caught minke whales and that early results suggest they are sensitive to a much broader range of frequencies than originally thought.

Two animals tagged in the Lofoten area have been observed travelling far into the Barents Sea.

The 2014–2019 Norwegian mosaic survey estimate for minke whales was approved by the IWC and for the total survey area the estimate was 149,700 (CV = 0.152) animals.

Sigurðsson informed of a recent study on whale movements in relation to capelin (NAMMCO/SC/30/FI23), which showed that both minke whales and humpback whales south of the Denmark Strait follow capelin movements closely, in contrast with toothed, fin, and blue whales.

10.11. FIN WHALE — UPDATES

NAMMCO/SC/30/FI18 shows that the use of ear plugs to determine fin whale age is a valid method. NAMMCO/SC/30/FI16 suggests variability in fin whale feeding patterns, while NAMMCO/SC/30/FI17 proposes the use of Alkenone $U^{k'}_{37}$ to determine the geographic origin of fin whale individuals.

10.12. HUMPBACK WHALE — UPDATES

Biuw informed of two recent studies on humpback whales in Norwegian waters, one of which relates foraging movements to the distribution of capelin (NAMMCO/SC/30/FI33) and the other of which pertains to the use of acoustic startle methods as an entanglement deterrent (NAMMCO/SC/30/FI34).

Sigurðsson mentioned two publications which showed long-range migrations of humpback whales across the Atlantic, using photo-identification (NAMMCO/SC/30/FI19, NAMMCO/SC/30/FI20).

10.13. KILLER WHALE — UPDATES

The acoustic startle technique trialled on humpback whales appears to work quite well in deterring killer whales from purse seine nets (FI34).

A study has been conducted on genetic connectivity of killer whales between Greenland and Iceland and will be presented at the European Cetacean Society conference this year.

Ongoing research on killer whales in Iceland shows that a large proportion of these animals do not have a fish- or mammal-specialised diet, and there are some indications that Greenlandic killer whales also have a mixed diet. However, these latter samples also show very high concentrations of PCBs, which would indicate a higher proportion of mammals in their diet. A comprehensive analysis of dietary specialisation of killer whales in the North Atlantic was also published in 2023 (NAMMCO/SC/30/FI28).

10.14. SEI WHALE — UPDATES

Passive acoustic monitoring in Svalbard has revealed considerable presence of sei whales in the area, which contradicts the complete lack of sighting records. This could indicate that the species is often visually misidentified, e.g., as fin or minke whale.

10.15. SPERM WHALE — UPDATES

Lydersen informed of continued analysis of data from tagged sperm whales, showing a complete lack of synchronicity in their migration patterns. A comprehensive overview will be presented at SC31.

11.MANAGEMENT PROCEDURES

11.1. REVIEW AND STATUS OF ACTIVE REQUESTS (R-1.6.5, R-1.6.8)

R-1.6.5 (2018, standing) *requests that "struck and loss rates should be subtracted from future advice on sustainable removals in Greenland, with the advice being given as total allowable landings."*

R-1.6.8 (2023, ongoing) *states that "the SC is requested to prepare a tentative long-term plan (10-15 years) for the assessments of all the stocks within the remit of NAMMCO. The SC should also propose a system for categorizing the status of these stocks reflecting abundance, status of knowledge, and levels of removals."*

R-1.6.5. is a standing request considered by all WGs dealing with the assessment of removals. The SC addressed R-1.6.8. under items 11.2. and 11.3.

11.2. ABUNDANCE / ASSESSMENT / CONSERVATION STATUS TABLES

11.2.1. Traffic Light System for categorising stocks

Garagouni presented a draft version of a categorisation process using a red-amber-green traffic light system (NAMMCO/SC/30/16), which could be used in partial fulfilment of R-1.6.8. However, the SC expressed concerns that merging multiple criteria in this way is likely to introduce more bias than clarity. Each parameter would have to be very explicitly defined and weighted carefully. Such a system should also not contraindicate stock statuses listed by organisations such as the IUCN and IWC. Moreover, while there is some educational value in a simplistic overview of stocks, the potential for misinterpretation by a non-scientific audience is high. Other approaches, such as used by the IWC or integrated ecosystem assessments, might be more appropriate—however, the SC is not certain about the need for such an exercise and seeks further clarification on the Council's request. The SC is of the opinion that NAMMCO already has a well-functioning system in place, where at each SC meeting new information on all species is considered, and the workplan is developed, including priorities of each country. The amount of time needed to create and maintain an updated classification system that would include every stock within the NAMMCO remit should be taken into account.

11.3. LONG-TERM ASSESSMENT PLAN

In response to request R-1.6.5, the SC developed a long-term plan (Table 8), which can be adjusted as needed. Desportes highlighted that data gaps should be addressed with specific recommendations to the Parties, rather than by constantly deferring assessments.

Table 8. Long-term assessment plan for harvested stocks as proposed by SC/30, showing the next three assessment years and assessment frequency for each species. Species subjected to removals but not included in the schedule will be assessed by the SC or are outside the remit of NAMMCO (such as bowhead whales and humpback whales, assessed by the IWC). *: The SC has requested guidance from the MCC on future assessments of narwhal in East Greenland. (continued on next page)

Species	Frequency (years)	Assessment year		
Walrus	5	2026	2031	2036
Ringed Seal	5	2029	2034	2039
Bearded Seal	5	2027	2032	2042
Beluga and Narwhal (West Greenland)	5	2025	2030	2035
Narwhal (East Greenland)*	3	2026	2029	2032
Pilot Whale	5	2025	2030	2035
Dolphin	5	2028	2033	2038
Harbour Porpoise	7	2026	2033	2040
Large Whales (Fin and Minke)	7	2025	2032	2039
Harp and Hooded Seals	2	2025	2027	2029

Coastal Seals	6	2026	2032	2038
Killer Whale	9	2028	2037	2046

12. NASS 2024 PLANNING

Hansen presented the progress of the NASS 2024 Scientific Planning Committee (SpC). The report and minutes of all SpC meetings held in 2023 were provided in NAMMCO/SC/30/12.

Summary

The NASS 2024 SpC met on January 23, to discuss stratification design of the upcoming survey. The securement of survey platforms to cover all areas is in place. With the exception of one stratum (Icelandic redfish survey block), presumably with a finalised decision within the next two weeks, all the strata have been delineated (Figure 6). The SpC will reconvene in February 2024 to go through the final strata and transect design. The group agreed to allocate more effort to the high-density area of baleen whales between East Greenland and Iceland, to align the survey area with the European sighting survey (SCANS), and to have four observers onboard the Norwegian and Faroese mackerel surveys, thus increasing the NASS survey area. The decision to use both the Norwegian and Faroese mackerel surveys as sighting survey platforms has freed up more sailing days for the Faroese and Icelandic dedicated vessels, which will be deployed in such a way as to maximise coverage of the common area surveyed by all previous NASS, as well as to ensure complete alignment of the Icelandic, Greenlandic, and Norwegian strata. The NASS SpC will hold an additional meeting in May 2024 to review the protocols, software, and equipment to be used during NASS 2024. The group recognises that the MINTAG project is still in the experimental stage and that a large deployment of satellite tags will not be possible during the NASS survey, but some experimental tagging will take place.

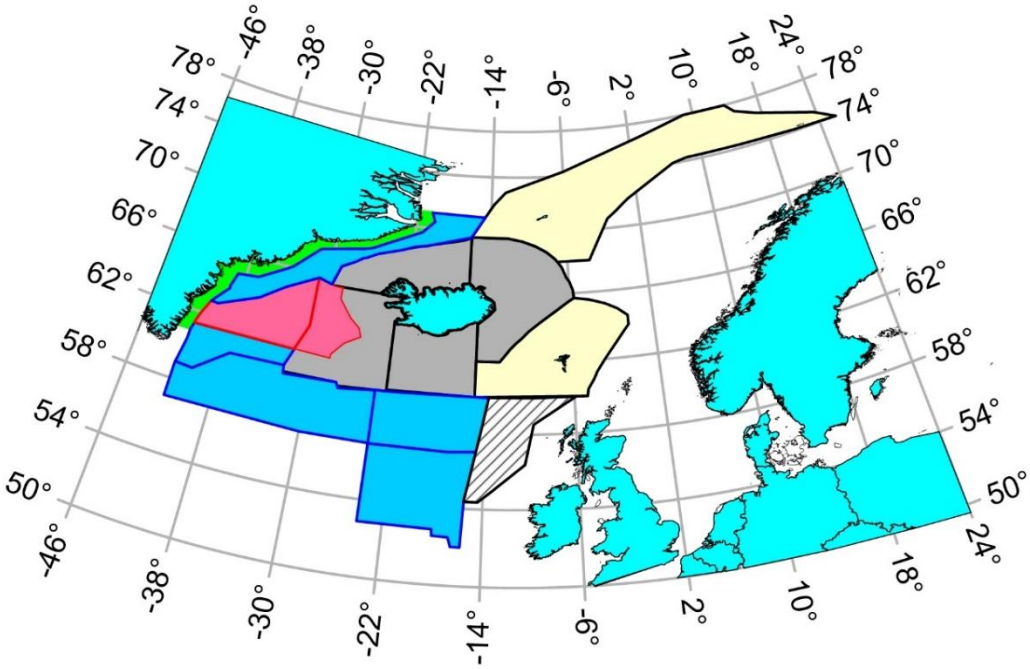

Figure 6. Proposed strata for NASS 2024. Green: East Greenland aerial survey. Blue: Dedicated Icelandic and Faroese survey. Grey: Icelandic mackerel survey. Red: Tentative Icelandic redfish survey (NB: there will be no overlap between mackerel and redfish survey strata). Yellow: Faroese and Norwegian mackerel survey. Crosshatch: SCANS Block 8.

Discussion

The SC thanked the SpC for its work, commended the prioritisation of survey needs and tasks, and emphasised the need for all protocols being defined well in advance of the survey.

13.WORK PROCEDURES

13.1. WORKING GROUP ON GENETICS — PROPOSED TERMS OF REFERENCE

Morten Tange Olsen (Globe Institute, Denmark) summarised the report on the formation of a technical Working Group on Genetics (NAMMCO/SC/30/09).

Summary

In 2023, the SC expressed interest in examining if it was relevant to establish a technical Working Group on Genetics (Genetics WG) to provide advice on the use of genetic data in species assessments. Typically, species-specific WGs within NAMMCO only include the geneticist presenting the data on stock structure; a technical WG with multiple genetics experts would improve the reliability of the stock structure information and/or hypotheses used in the assessments and, therefore, the robustness of stock assessments.

To this end, invitations were extended to relevant experts in marine mammal genetics and the first meeting of the Genetics WG was held as a video conference on October 25, 2023. The meeting was chaired by Olsen and included 10 experts, as well as three representatives from the NAMMCO Secretariat. The overall goal of the meeting was to discuss the scope and format of such a WG, as well as how the group could best serve NAMMCO's mission.

The main activities and outcomes of the meeting were:

Drafting tentative ToRs, with the main scope of the WG being:

i) To review the genetic data that will be used in NAMMCO's species assessments.
ii) To serve as a consultation body on topics related to genetics for NAMMCO's working groups.
iii) To detect data and knowledge gaps needed for the assessment of specific species/stocks and provide NAMMCO with advice on how to move forward to fill such gaps.

Discussing possible overlaps in goal, format, and species with the International Whaling Commission's Intersessional Correspondence Group on Genetics, as well as the usefulness of mapping the expertise and skills within the WG, both in terms of methodology and species biology

Agreeing that the WG would ideally not just focus on evaluating genetic assessments of stock structure for defining management units, but also other applications of genetic data and analyses, such as inference of demographic and evolutionary histories, environmental DNA, diet determination, epigenetics, and gene expression, to mention a few.

Agreeing that the format of the WG can remain flexible, with a few members conducting evaluation of genetic data as the need arises, and the entire WG being invited to review and approve the assessment. A few WG representatives can present the results (online) and respond to any potential questions when relevant.

Agreeing that the WG will function mainly as an email/online group, that will meet when it is necessary to provide advice to the SC on a specific species/stock. The WG may, however, decide to hold a meeting when it deems it relevant.

Discussion

The SC **endorsed** the draft ToRs and a flexible command line for the Genetics WG, recognising that the workflow can be adapted according to the specific requirements of each assessment. For a given stock, the Genetics WG can assess the types of data needed to carry out an assessment and, if necessary/applicable, review the information used in the preceding assessment. Existing data, methodology, and interpretation of results should be examined and recommendations for additional analyses given as needed. When relevant working documents are submitted for use by a stock assessment WG, the Genetics WG should provide feedback thereon, reviewing not only the quality or type of data, but also the robustness of the sampling and analytical methods employed. Members of the Genetics WG should also be present during the assessment itself.

The SC **agreed** to oversee the prioritisation of the Genetics WG tasks, according to stock assessment needs. In agreement with this, the SC required that all future SC meetings systematically include *Requests to Genetic WG* as an agenda item. For 2024, the SC **decided** the Genetic WG should concentrate on evaluating the current genetic knowledge and potential needs for additional analyses of pilot whales, narwhals, and belugas, preferably before their respective next assessments. Information is required specifically for:

- **Pilot whales**: examination of the genetic connectivity between different hunting areas (East Greenland, West Greenland, Faroe Islands, Iceland), as well as population structure (if any) across the North Atlantic.
- **Narwhals**: examination of the genetic discreteness of putative small stocks in East Greenland, as well as population structure between Canada and Greenland.
- **Belugas**: further examination of the genetic provenance of the animals occurring in East Greenland; examination of the genetic relationship between the West Greenland winter harvest and the Southeast Baffin Island population; examination of stock structure of belugas in the High Arctic, namely those wintering in North Water, those available to the hunt in Northwest Greenland (Qaanaaq), and those available to the fall and winter hunt in West Greenland.

The SC **nominated** Olsen as Chair of the Genetics WG and suggested including additional members from Norway and Iceland in the WG.

13.2. SCIENTIFIC COMMITTEE AND WORKING GROUP MEETINGS

El Bani Altuna reminded SC members to forward relevant publications (both old and new) to the Secretariat for the purpose of keeping up with the latest research in the marine mammal field. Additionally, for clarity and precision in communication and workflows, any delineation of management and survey areas established in WGs, WS, or meetings should be submitted to the Secretariat as a shapefile for archiving and mapping/dissemination.

To improve the workflow of upcoming SC meetings, the Secretariat clarified that the Chair's summary for the SC report should be limited to 3–5 pages. Furthermore, the Secretariat suggested that the WG Convenor's presentation should be kept between 5 and 10 minutes, depending on the complexity of the theme and the duration of the meeting. El Bani Altuna also informed the SC that gender-neutral language is used in the reports.

To facilitate a smooth generational turnover in NAMMCO, the Secretariat encouraged the SC to consider mid- and early-career scientists as invited experts and (vice-) Chairs of subsidiary bodies. The SC supported this suggestion and **proposed** that NAMMCO provide separate funds to facilitate such an initiative.

13.3. MEETING ETIQUETTE

Desportes reminded the SC about the meeting etiquette and the code of conduct. The SC **agreed** to include the ICES code of conduct and etiquette (NAMMCO/SC/30/FI30a and NAMMCO/SC/30/FI30b) as a For Information document in all upcoming meetings. The Secretariat will look into revising this document to better align with NAMMCO's structure.

14.NAMMCO WEBSITE

14.1. WEBSITE UPDATES & SPECIES PAGES (R-1.8.3)

R-1.8.3 (2022, standing) *states that "acknowledging the importance of the website as NAMMCO's main dissemination tool, and the value of the species pages, the Council requests the SC to continue its regular review of these pages following the procedure proposed by the SC/26 (2019).*

In answer to request R-1.8.3, which this year tasked the SC with reviewing the species pages for ringed seal, bearded seal, white-beaked dolphin, and Atlantic white-sided dolphin, the draft updates for each species were assigned to an SC member for initial review. Following that, the SC as a whole will adopt the changes by correspondence, by March 1, 2024.

The Chair suggested that in future, to maximise efficiency, the draft updates should be shared with the SC at least two months prior to the meeting itself.

15. NAMMCO SCIENTIFIC PUBLICATIONS UPDATE

15.1. VOLUME 13

Garagouni informed the SC that Volume 13 of NAMMCO Scientific Publications, "Marine Mammals in the North Atlantic: Part II", currently has four manuscripts in review, and that an additional four manuscripts are anticipated to be submitted by the end of January 2024. The volume will be published in 2024.

15.2. VOLUME 14

Garagouni initiated the discussion on the theme for Volume 14, and the SC **decided** to centre the volume around the topic of *"Anthropogenic Impacts on Marine Mammals".* A volume with this theme will serve as a suitable platform for publishing both catch statistics and research findings on anthropogenic disturbances.

16. FUTURE WORKPLANS

The schedule **recommended** by the SC for 2024 is presented in Table 9 below, together with a provisional schedule for 2025 and 2026. The recommendation of the SC for future workplans aligns with the long-term assessment plan presented under item 11.2.

The 31st SC meeting, which will be hosted by Norway, will be held on January 20–24, 2025. The precise location will be determined at a later time.

Table 9. Future workplan proposed by SC/30.

2024	2025	2026
WG and WS meetings: - WG on By-Catch - Genetics WG	**WG and WS meetings:** - Large Whale Assessment WG - Pilot Whale WG - Abundance Estimate WG - WG on Harp and Hooded Seals - JWG NAMMCO-JCNB	**WG and WS meetings:** - Harbour porpoise WG - Coastal Seals WG - Walrus WG - Narwhal in East Greenland WG (pending MCC decision) - Abundance Estimate WG
Other meetings and activities: - NASS 2024 SpC: meetings online & in person - MINTAG StG: online meetings - MINTAG: deployment field work and analysis - NASS 2024 surveys	**Other meetings and activities:** - MINTAG StG: online meetings - MINTAG: deployment field work and analysis	**Other meetings and activities:** - MINTAG StG: online meetings - MINTAG: deployment field work and analysis

17. BUDGET 2023–2024

The 2023 SC budget for inviting external experts to WG meetings was initially NOK 211,000 and after reallocation NOK 305,000. The SC external expert budget for 2024 and draft budget for 2025 adopted by the Council in March 2023 were respectively NOK 222,000 and NOK 244,000. The 2023 SC external experts' expenses in 2023 were over budget and amounted to NOK 331,940.

The budget and accounting for the NASS 2024 and MINTAG projects are kept separate from those of the SC, under their specific items in the budget of the Commission. They are therefore not included in the numbers above.

Taking into account its proposed long-term workplan and different logistic contingencies that required delaying some of the planned WG meetings, the SC proposed a modified external expert budget for 2024 and 2025, and also proposed a draft external expert budget for 2026.

18. ANY OTHER BUSINESS

In response to the escalating public interest and growing pressures on marine mammals from the shipping industry, both industrial and tourism-related, the Secretariat questioned whether disturbances caused by the shipping industry should not be assessed by the SC. The focus should be put particularly on areas anticipating significant increases in vessel traffic due to activities like whale- and seal-watching and seismic surveys. This aligns with the suggestion from SC/29 to revisit Request R-1.5.4, although SC/29 also considered the request answered in 2023.

Greenland, Iceland, and Norway have voluntary guidelines for whale-watching. If such an initiative were to progress further, Granquist noted the importance of not only focusing on whale-watching activities but also on land and boat-based seal-watching, as seals across all NAMMCO countries may face increasing pressure from the shipping industry and recreational activities.

The SC **reiterated** that, in response to Request R-1.5.4., all WGs systematically include *Other anthropogenic impacts (besides removals)* as an agenda item in their consideration, and these should include disturbance from vessels and recreational activities.

19. REVIEW OF REPORT

A draft report was accepted by the SC before the close of the meeting on January 26. The final report was accepted by correspondence on February 9, 2024.

20. MEETING CLOSE

The Chair thanked all the participants for their active input to the discussions. Iceland was thanked for hosting the 30th meeting of the SC, and for arranging a guest presentation by Dr Filipa Samarra on "The Vestmannaeyjar Research Centre: research on killer whales and other cetaceans". The members of the Secretariat were commended for their thorough work both in preparation for and during the meeting.

As it was their last participation in such a meeting as SC members, Nils Øien and Kjell T. Nilssen were warmly thanked and applauded for all their contributions to the work of NAMMCO and the SC over the years.

The meeting was closed at 15:25 CET on Friday January 26, 2024.

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APPENDIX 1: AGENDA

1. **Meeting opening**
2. **Adoption of Agenda**
3. **Appointment of Rapporteurs**
4. **Review of Available Documents and Reports**
   - 4.1. National and annual progress reports
     - 4.1.1. Updates from observers
   - 4.2. Working group reports
   - 4.3. Other reports and documents

5. **Updates from Council**
   - 5.1. General comments
   - 5.2. Endorsed SC work plan
   - 5.3. Update on NAMMCO processes
     - 5.3.1. Working Group on Enhancing User Involvement in NAMMCO Decision Making

6. **Interactions with other organisations**
   - 6.1. ASCOBANS
   - 6.2. ICES
   - 6.3. OSPAR
   - 6.4. Ostrobothnian Fisheries Association
   - 6.5. Arctic Council

7. **Collaborative projects**
   - 7.1. MINTAG Project
   - 7.2. Dissemination: GUARDNA Project
   - 7.3. Cooperation with Japan
     - 7.3.1. Northeast Atlantic–Northwest Pacific Ecosystems
     - 7.3.2. Further collaboration
   - 7.4. Other collaborations

8. **Environmental/Ecosystem Issues**
   - 8.1. Marine Mammal / Fisheries Interactions
     - 8.1.1. Review and status of active requests (R-1.1.5, R-1.1.9, R-1.1.10)
     - 8.1.2. By-Catch Working Group

8.1.2.1. BYCWG Data call for risk assessment

8.2. Multi-species approaches to management and modelling

8.2.1. Review and status of active requests (R-1.2.1, R-1.2.2)

8.2.2. Discussion of workshop on model portfolio

8.3. Environmental issues

8.3.1. Review and status of active requests (R-1.5.3)

8.3.2. Updates

9. Seals & Walrus Stocks – Status and Advice to the Council

9.1. Bearded seal

9.1.1. Review and status of active requests (R-2.7.1)

9.1.2. NAMMCO Panarctic Bearded Seal Workshop

9.1.3. Updates

9.2. Ringed seal

9.2.1. Review and status of active requests (R-2.3.3)

9.2.2. Ringed Seal Working Group

9.2.3. Updates

9.3. Harbour and Grey seals

9.3.1. Review and status of active requests (R-2.4.2, R-2.5.2)

9.3.2. Coastal Seals Working Group

9.3.3. Updates

9.4. Harp and Hooded seals

9.4.1. Review and status of active requests (R-2.1.2, R-2.1.9, R-2.1.10)

9.4.2. Benchmark Workshop for Harp & Hooded Seals

9.4.3. Joint Working Group on Harp and Hooded Seals

9.4.4. Updates

9.5. Walrus

9.5.1. Updates

9.5.2. Plans for Walrus Working Group meeting

10. Cetacean Stocks – Status and Advice to the Council

10.1. Narwhal

10.1.1. Review and status of active requests (R-3.4.11)

10.1.2. *Ad hoc* Working Group on Narwhal in East Greenland

10.1.3. Updates

10.2. Beluga

10.2.1. Review and status of active requests (R-3.4.11)

10.2.2. *Ad hoc* Working Group on Narwhal in East Greenland

10.2.3. Updates

10.2.4. Plans for NAMMCO-JCNB Joint Working Group

10.3. Harbour porpoise

10.3.1. Review and status of active requests (R-3.10.1)

10.3.2. Updates

10.4. Dolphins

10.4.1. Review and status of active requests (R-3.9.6)

10.4.2. Working Group on Dolphins

10.4.3. Updates

10.5. Pilot whale

10.5.1. Review and status of active requests (R-3.8.6)

10.5.2. Updates

10.5.3. Data availability for next Working Group meeting

10.6. Northern bottlenose whale

10.6.1. Review and status of active requests (R-1.7.11)

10.6.2. Updates

10.7. Beaked whales — Updates

10.8. Blue whale — Updates

10.9. Bowhead whale — Updates

10.10. Common minke whale — Updates

10.11. Fin whale — Updates

10.12. Humpback whale — Updates

10.13. Killer whale — Updates

10.14. Sei whale — Updates

10.15. Sperm whale — Updates

11. Management Procedures

11.1. Review and status of active requests (R-1.6.5, R-1.6.8)

11.2. Abundance / Assessment / Conservation status tables

11.2.1. Traffic Light System for categorising stocks

11.3. Long-term Assessment plan

12. NASS 2024 Planning

12.1. Survey effort overview

12.2. Protocols, software, and equipment overview

12.3. Allocation of Norway's voluntary contribution

13. Work procedures

13.1. Working Group on Genetics — Proposed Terms of Reference

13.2. Scientific Committee and Working Group meetings

13.3. Meeting etiquette

14. NAMMCO Website

14.1. Website Updates & Species Pages (R-1.8.3)

15. NAMMCO Scientific Publications Update

15.1. Volume 13

15.2. Volume 14

16. Future Workplans

17. Budget 2023–2024

18. Any Other Business

19. Review of Report

20. Meeting Close

APPENDIX 2: LIST OF PARTICIPANTS

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APPENDIX 3: LIST OF DOCUMENTS

Working Documents

Doc. number	Name/Description	Agenda item
SC/30/01a	Draft Agenda	2
SC/30/01b	Draft Agenda Annotated	2
SC/30/02	Draft List of Participants	1, 4
SC/30/03	Draft List of Documents	4
SC/30/04	List of Active Requests to SC from Council	several
SC/30/05	Report of the Working Group on By-Catch	8.1.2
SC/30/06	Report of the Working Group on Coastal Seals	9.3
SC/30/07	Report of the Working Group on Dolphins	10.4
SC/30/08	Report of the Working Group on Ringed Seals	9.2
SC/30/09	Report on formation of *Ad hoc* Working Group on Genetics	13.1
SC/30/10	Report of the *Ad hoc* Working Group on Narwhal in East Greenland	10.1, 10.2
SC/30/11	Report of the Joint Working Group on Harp and Hooded Seals	9.4.3
SC/30/12	Report of the NASS2024 Scientific Planning Committee	9.1.2
SC/30/13	Report of the Benchmark Workshop on Harp and Hooded Seals	9.4.2
SC/30/14	Report of the Panarctic Bearded Seal Workshop	12
SC/30/15	Report of the MINTAG Steering Group	7.1
SC/30/16	*Draft* Traffic Light System for stock status categorisation	11.1.1
SC/30/17	Report on formation of Working Group on Enhancing User Involvement in NAMMCO Decision Making	5.3.1
SC/30/18	NAMMCO website species pages for review: Ringed Seal	14
SC/30/19	NAMMCO website species pages for review: Bearded Seal	14
SC/30/20	NAMMCO website species pages for review: White-beaked Dolphin	14
SC/30/21	NAMMCO website species pages for review: Atlantic White-sided Dolphin	14
SC/30/22	Update on GUARDNA Educational project	7.2
SC/30/23	Update on SC Working Group Budget	17
SC/30/24	Collaborative North Pacific minke whale project	7.3.1
SC/30/25	Update on ICES activities in 2023	6.2

For Information Documents

Doc. number	Name/Description	Agenda item
SC/30/FI01	National Progress Report 2022 – Faroe Islands	4
SC/30/FI02	National Progress Report 2022 – Greenland	4
SC/30/FI03	National Progress Report 2022 – Iceland	4
SC/30/FI04	National Progress Report 2022 – Norway	4
SC/30/FI05	National Progress Report 2022 – Makivvik Corporation	4
SC/30/FI06	Small Cetaceans Progress Report 2022 – Japan	4
SC/30/FI07	Large Cetaceans Progress Report 2023 – Japan	4
SC/30/FI08	List of Recommendations endorsed in 2023	4
SC/30/FI09	Endorsed SC Workplan for 2023–2025	4, 16
SC/30/FI10	MINTAG Meeting minutes January 2023	7.1
SC/30/FI11	MINTAG Report October 2023	7.1
SC/30/FI12	MINTAG Progress Report November 2023	7.1
SC/30/FI13	Report of ASCOBANS 28th AC meeting	6.1
SC/30/FI14	Report of OSPAR workshop – RAP for underwater noise	6.3
SC/30/FI15	NAMMCO participation in Ostrobothnian Fisheries Association webinar	6.4
SC/30/FI16	*Rita et al. 2023* Amino acid-specific nitrogen stable isotope analysis reveals the trophic behavior of Icelandic fin whales in winter and suggests variable feeding strategies	10.11
SC/30/FI17	*Rita et al. 2023* Alkenone $U^{k'}_{37}$ index differs between thermally separated populations of fin whales and krill	10.11
SC/30/FI18	*Campana et al. 2023* Bomb radiocarbon determines absolute age of adult fin whales, and validates use of earplug growth bands for age determination	10.11
SC/30/FI19	*Basran et al. 2023* First documented migration of an Icelandic humpback whale mother and calf pair from the West Indies breeding grounds	10.12
SC/30/FI20	*Bacon et al. 2023* First documented humpback whale (*Megaptera novaeangliae*) photoidentification match and roundtrip migration between Iceland and the Turks and Caicos Islands	10.12
SC/30/FI21	*Chosson et al. 2023* First record of Risso's dolphin *Grampus griseus* (Cuvier, 1812) in Icelandic waters	10.4
SC/30/FI22	*Autenrieth et al. 2023* Genome-wide analysis of the harbour porpoise (*Phocoena phocoena*) indicates isolation-by-distance across the North Atlantic and potential local adaptation in adjacent waters	10.3
SC/30/FI23	*MFRI 2023* Main findings from capelin research study 2018–2022	10
SC/30/FI24	*Gose et al. 2023* Stranding collections indicate broad-scale connectivity across the range of a pelagic marine predator, the Atlantic white-sided dolphin (*Lagenorhynchus acutus*)	10.4
SC/30/FI25	*Jossey et al. 2023* Population structure and history of North Atlantic Blue whales (*Balaenoptera musculus musculus*) inferred from whole genome sequence analysis	10.8

SC/30/FI26	*Llobet et al. 2023* The Arctic and the future Arctic? Soundscapes and marine mammal communities on the east and west sides of Svalbard characterized through acoustic data	8.3, 9, 10
SC/30/FI27	*Berger et al. 2023* Alternative and legacy flame retardants in marine mammals from three northern ocean regions	8.3
SC/30/FI28	*Remili et al. 2023* Quantitative fatty acid signature analysis reveals a high level of dietary specialization in killer whales across the North Atlantic	10.13
SC/30/FI29	Telemetry Progress Report 2023 – Japan	4.1.1
SC/30/FI30a	ICES Meeting Etiquette	13.3
SC/30/FI30b	ICES Code of Conduct	13.3
SC/30/FI31	Report of the Working Group on Harbour Porpoise 2022	10.3, 10.5
SC/30/FI32	Report of the 8th MINTAG StG Meeting	7.1
SC/30/FI33	*Vogel et al. 2023* Humpback whale foraging movements	10.12
SC/30/FI34	*Langstein 2023* Effect of acoustic startle technology on killer and humpback whales	10.12, 10.13
SC/30/FI35	Icelandic request for new Coastal Seal Management Plan	9.3

APPENDIX 4: STATUS OF COUNCIL REQUESTS

Active requests for advice considered as answered by the MCs

Three requests for advice from the SC were considered satisfactorily answered by the MCs *(or replaced by a new reformulated request)* and recommended to be closed by the Council.

[Environmental Issues] ***Request R-1.5.4:*** *To advise on the best process to investigate the effects of non-hunting related anthropogenic stressors on marine mammal populations, including the cumulative impacts of global warming, by-catch, pollution and disturbance.*

[Ringed seal] ***Request R-2.3.1:*** *To advise on stock identity of ringed seals for management purposes and to assess abundance in each stock area, long-term effects on stocks by current removals in each stock area, effects of recent environmental changes (i.e., disturbance, pollution, climate change) and changes in the food supply, and interactions with other marine living resources. (replaced by Request R-2.3.3).*

[Walrus] ***Request R-2.6.3rev****: Provide advice on the effects of human disturbance, including fishing and shipping activities, tourism, oil exploration and mineral extractions, on the distribution, behaviour, and conservation status of walrus in Greenland.*

Upon recommendation from the MCs, recommended Council **agreed** to close the above-mentioned requests.

Active requests for advice recommended to be considered as standing by the MCs

The MCs considered that two requests concerning environmental issues, to which the SC had provided some answers, remained fully pertinent and should get a standing status.

Request R-1.1.10: *In the light of the distributional shifts seen under T-NASS 2007 and later surveys, investigate dynamic changes in spatial distribution due to ecosystem changes and functional responses.*

Request R-1.5.3: *To monitor the development of the Mary River Project and assess qualitatively or if possible, quantitatively the likely impact and consequences on marine mammals in the area.*

Upon recommendation by the MCs, the Council **agreed** that requests R-1.1.10 and R-1.5.3 be given the status of standing request.

Active requests for advice not considered a priority by the MCs

The MCs considered that two requests concerning Multispecies Approach to Management and Modelling were still pertinent but should not be regarded as a priority by the SC because of the limited progress in including marine mammals in ecosystem multispecies modelling. The SC should however follow advances in the field of multispecies modelling and come back to these two requests when it will be deemed timely.

Request R-1.1.9*: In addressing the standing request on ecosystem modelling and marine mammal fisheries interaction, to extend the focus to include all areas under NAMMCO jurisdiction.*

Request R-1.2.1*: To consider whether multispecies models for management purposes can be established for the North Atlantic ecosystems and whether such models could include the marine mammal compartment. If such models and the required data are not available, then identify the knowledge lacking for such an enterprise to be beneficial to proper scientific management and suggest scientific projects which would be required for obtaining this knowledge.*

Following the MCs recommendation, the Council agreed that responding to requests R-1.1.9 and R-1.2.1 was not a priority for the SC.

APPENDIX 5: PREVIOUS PROPOSALS FORWARDED TO PARTIES

In March 2023, the NAMMCO Management Committees endorsed the following recommendations for research, conservation, and management from the SC, and forwarded them to the Parties.

1. PROPOSALS FOR CONSERVATION AND MANAGEMENT

GREENLAND

Environmental issues

- No ship anchoring should occur in Store Hellefiske Banke, off West Greenland, due to its importance as a feeding ground for many Arctic seabirds and marine mammal species.
- Greenland invites Canadian experts to participate in reviewing monitoring programs, plans and results of the Dundas mine in North-West Greenland.

Killer whale

- Regulate the hunt of killer whales and restrict quotas in a precautionary way.
- Existing catch records be validated and reporting on catches (including struck and loss rates) be improved.
- Killer whales be included in existing mandatory reporting schemes.

Narwhal

- Due to the observed displacement of narwhals from Eclipse Sound caused by shipping traffic and associated ice breaking, future developments avoid shipping within narwhal summering aggregations.
- Because ship traffic causes significant disturbance to narwhals at distances from 0 to 20 km, while icebreaking can cause impacts at distances from 0 to 35 km, these values be used to establish buffer zones around narwhal summer aggregations and establish traffic corridors to protect migration routes and winter foraging grounds.
- Hunt management advice should account for the displacement and possible associated changes in fecundity and survival, both in disturbed summer aggregations, as well as in aggregations affected by the displaced animals.

Beluga

- Ship speed regulations of 8 knots be extended to south of the beluga migration route passing Cape York in September-October. This recommendation does not include a buffer around the timing of shipping.
- Any by-catch of belugas in East Greenland be documented in the Special Reports.
- In case of live by-caught belugas in East Greenland, all efforts be made to release the animal.
- Additional samples be taken from all dead by-caught belugas in East Greenland, and all caught belugas in West Greenland, besides the already mandatory information (date and location of the by-catch, sex, presence/absence of a foetus). This additional information includes skin biopsy sample, length, a tooth, girth measurements, and whether there is milk in the mammary glands of females.
- The documentation of hunter observations of belugas in East Greenland is collected in a structured manner, including photographs or video footage of the animals, information on where and when the sighting took place, and how many individuals were seen.

NORWAY

Harbour porpoise

- Continue its efforts to reduce the by-catch of harbour porpoises which is deemed unsustainable.
- Assess the compliance of the fleet to the pinger regulations in Vestfjorden as a basis for evaluating the efficacy of the pinger mandate.
- Consider expanding the use of pingers to areas north and west of Vestfjorden.
- Due to the present unsustainable level of by-catch, consider the best way of ensuring that the mandatory use of pingers is enforced.
- Implement the use of REM systems in fishing vessels outside the CRF, to complement the by-catch data from the CRF.

2. RECOMMENDATIONS FOR NEW RESEARCH

ALL PARTIES

Killer whale

- To further sampling efforts, as well as further analyses of pollutant levels and genetic analyses to help determine stock structure.

FAROE ISLANDS

Harbour porpoise

- Support the creation of an App where users of coastal areas (i.e., fishers, recreational boats) can report observations, catch and by-catch of harbour porpoises.
- Initiate the collection of biological data on harbour porpoise.

White-beaked, White-sided and Bottlenose dolphins

- Age determination from random teeth samples from different periods of time should be added to the age structure information on *Lagenorhynchus acutus*.
- Investigate any changes in age structure over different years to resolve whether some cohorts are underrepresented in the samples.
- Complete the analyses of life history parameters.
- Together with Greenland, collect data for genetic analyses and make sure they are integrated within the current European genetic analyses for Lagenorhynchus sp. coordinated by ASCOBANS.

Pilot whale

- Given the high number of available data (2000+), 150+ teeth samples collected randomly in 2013-2022 should be aged and the corresponding reproductive data analysed to obtain a long-term trend in life history parameters.
- Collect and analyse genetic samples together with Iceland and Greenland, to get better knowledge on stock identity.
- Investigate the potential relationship between pollutants and life history parameters of pilot whales between the first sampling period (1986-1989) and the present one (2013-2022).

GREENLAND

Narwhal

- Conduct tagging studies to determine impacts of shipping in Baffin Bay.
- Obtain biological samples (brains, organs etc.) and morphometrics from the narwhal winter hunt in Disko Bay and the spring hunt in other areas of West Greenland.

White-beaked, White-sided and Bottlenose dolphins

- Increase effort in collecting samples for genetic analysis.
- Prepare catch statistics separating both species, where possible.

Walrus

- (**High priority**) The regional aerial survey of the east side of Smith Sound be the minimum area that should be covered for monitoring walrus abundance and distribution. Surveys should occur in April, annually during the first 3 years of production, to allow detection of any substantial changes.
- The satellite imagery of Wolstenholme Fjord be collected annually to determine walrus density, and eventually walrus counts if <30 cm resolution imagery becomes available.
- The telemetry data on walrus habitat use, distribution and migration patterns be combined with a study of benthos covering the foraging areas in Wolstenholme Fjord to improve the assessment of the relative importance of the potential foraging area impacted by the mining operation (disturbance and siltification).

ICELAND

Harbour porpoise

- Generate the best back-calculated by-catch estimates (i.e., a time series going back to the beginning of the fishery) for the upcoming Icelandic assessment.

White-beaked, White-sided and Bottlenose dolphins

- Provide a table with the by-catch information available for each Lagenorhynchus species.

NORWAY

Harbour porpoise

- Increase tagging efforts to inform on movements, distribution, and stock delineation of harbour porpoise in Norwegian waters.
- Collect more biological samples to increase the life history information feeding the population models.
- Look into potential by-catch of porpoises in recreational fisheries to potentially include recreational fisheries in future by-catch estimates.
- Include by-catch data from larger (>15m) vessels into the by-catch estimates used for the assessment.
- Look into the effects of ghost nets on harbour porpoise mortality dynamics and, if a concern, increase efforts in removing ghost nets in areas of high porpoise density.
- By-catch estimates be back-calculated as far back as possible (e.g., until 1970) using landings and included in future assessments.

APPENDIX 6: MANAGEMENT FRAMEWORKS FOR MONODONTID STOCKS

General definitions to be used when discussing stock status and assessments.

Allowable take: Maximum landed catch that when summed with estimates of struck and lost and other anthropogenic removals, equal the maximum sustainable removals estimated for a stock.

Critical habitat: Habitat that is necessary for the survival or recovery of a stock.

Depletion level: The stock size divided by the equilibrium stock size (ESS) expressed as a percentage.

Near extirpation: A near extinction of a stock, i.e., a stock at such low densities that groups or individuals are rarely or no longer encountered within the range of the stock. For management purposes, a stock numbering less than 100 individuals.

- **At risk of Near extirpation:** A stock with a 10% or greater probability of near extirpation.
- **Insignificant risk of Near extirpation:** A less than 1% probability of near extirpation.

Equilibrium Stock Size (ESS): The population dynamic equilibrium abundance in the absence of removals and other anthropogenic impacts.

Removals: Individuals removed from the population due to anthropogenic activities including hunting (landed catch and struck and lost), by-catch, live-capture for display or research, vessel strikes and other sources of human-caused mortality.

Struck and lost: Animals killed as a result of hunting activities that were not landed and thus not included in the reported catch. Typically estimated as proportional to allowable take or landed catch.

Sustainable removals: Levels of total removals by hunting and other human actions that allow the stock abundance to remain above 60% of ESS or recover to 60% of ESS.

Stock: A unit of a species or population; should be designated and managed in such a way that the population and/or species as a whole persists throughout its range; often comprises a breeding population that occupies the same regions annually.

Stock size: point estimate of the stock abundance.

Proposed definitions of stock status, with five possible designations.

- **Maintained** (Not depleted): A stock for which the size estimate is at or greater than 60% of the ESS.
- **Depleted:** A stock for which the size estimate is less than 60% of the ESS.
- **Small:** A stock for which the size estimate is less than 1000 individuals or there are fewer than 400 reproductive age females in the stock.
- **Near extirpated:** A stock with 100 or fewer individuals (see Near extirpation definition above).
- **Undetermined:** Status of the stock can be undetermined due to insufficient data (data deficient), absence of assessment from the available data, or inability to conclude status from available data.

The following **management framework** was proposed, with advice regarding sustainable removals depending on stock status.

Small stocks should be assessed every three years, all others should be assessed at least every five years. Each assessment should include:

i) Reviews of new data on abundance, distribution, removals, life history, non-lethal anthropogenic impacts, and habitat changes.
ii) Review of the stock definition and structure.
iii) A data-based population assessment model or data requirements necessary to complete one.
iv) Conclusions on stock status when possible, including estimates for ESS, depletion level, and risk of (near) extirpation when relevant.
v) Recommendations on allowable take, seasonal and area closures to hunting, and mitigation of other anthropogenic impacts.
vi) Recommendations for timing of the next abundance survey.
vii) Requests for research and user data and observations.

Allowable take should be set to meet the following criteria using a data-based population assessment model:

For Maintained stocks: A probability of at least 70%/80% that total removals are less than 90% of the maximum possible removals that can be sustained at 60% of the ESS.

Rationale: Will ensure that the stock will remain above 60% ESS with a high probability but allow takes that will result in some decline if the population is approaching ESS.

For Depleted stocks: A probability of at least 70%/80% that the stock will not decline.

Rationale: Will allow recovery to 60% ESS in a reasonable time period and ensure that the stock will not decline further.

For Small stocks: No removals, unless a data-based assessment model can show a probability of at least 90% that the stock will not decline and 80% certainty that the abundance is above 300 individuals.

Rationale: It is possible that a small stock may be otherwise healthy (Maintained) and can tolerate sustainable removals. However, because small stocks are at risk from a number of threats that do not affect larger stocks and at risk of falling below levels where Allee effects, predation levels, loss of genetic diversity, loss of habitat experience, stochastic demographic variation or catastrophic events can make recovery substantially more difficult (see Hobbs et al. 2015, Hobbs et al. 2019), it is important to ensure that the stock recovers quickly and remains near its ESS. In addition to limiting hunting, other anthropogenic threats to recovery should be addressed and reduced or eliminated and critical habitat should be identified and protected.

For Near extirpated stocks: No removals.

Rationale: Near extirpated stocks are at risk of becoming extinct and a loss of even one animal from the stock results in a significant increase in this risk. A number of threats besides hunting including Allee effects, predation levels, loss of genetic diversity, loss of habitat experience, stochastic demographic variation or catastrophic events can make recovery substantially more difficult and should be addressed (see Hobbs et al. 2015, Hobbs et al. 2019). In addition to protection from hunting, other anthropogenic threats to recovery should be addressed and reduced or eliminated and critical habitat should be identified and protected.

For stocks of Undetermined status: Until numbers can be estimated and an assessment completed, the precautionary principle should be used to provide advice on a case-by-case basis.

APPENDIX 7: SC/30 RECOMMENDATIONS AND REQUESTS

This Appendix contains the recommendations *endorsed* by SC/30, grouped first by party to which they are directed, then by type of recommendation, and then by species. This includes *all* recommendations given by Workshops and Working Groups, as well as the SC itself. Recommendations *prioritised* by SC/30 are in boxes. Procedural recommendations and requests to the Council, MCs, and WGs are also included in the last section.

RECOMMENDATIONS TO ALL PARTIES

Recommendations for Conservation & Management

Harbour and grey seals

- Complete an assessment for coastal seals in each of the NAMMCO member countries as soon as the necessary data are available.

White-sided dolphin

- Considering the low levels of reported catch compared to the estimated population size, a new assessment might be conducted within the standard 5-year period, integrating the 2024 abundance estimate, full catch reporting, and validated age structure information.

Recommendations for Research with implications for Parties

Bearded seal

- Use genetic and telemetry data only from adult ringed seals or nursing pups sampled during the breeding season for population structure studies.
- Conduct partial surveys of ringed seals (as index).
- Ensure that efforts to determine population structure be continued.

- Make efforts to collect more samples and increase coverage for the circumpolar genetic analyses.
- Continue and expand screening for pathogens in bearded seals.

Ringed seal

- Carry out new studies to gain more insight on correction factors for ringed seal abundance estimates.
- Study the sensitivity of ringed seals to noise, particularly in areas of high ship traffic or tourism activities.

Harbour and grey seals

- Support the development of a Europe wide population model for grey seals through data provision and cooperation.
- Support a joint effort to deliver samples for genetic analysis of grey seals to improve knowledge on population structure and status.

Harp and hooded seals

- Efforts should continue to obtain reproductive samples. These are required for use in the population model.

White-beaked and white-sided dolphins

- To deploy satellite tags on both white-sided and white-beaked dolphins, preferably in areas other than the Faroe Islands, to obtain more movement and dispersion data.

MINTAG

- Make optimal platforms available for field efforts in 2024.

Recommendations for Research to Scientists

Bearded seal

- Use available genetic information and other lines of evidence (e.g., movement patterns) to produce a map with potential management zones, indicating information on catch data within their boundaries.
- Try to obtain DNA from Russian seal bones or other material in museum collections elsewhere, to provide samples from Russian waters. Old material from past Russian expeditions might be available in museums in the USA and Norway.
- Conduct modelling with external covariates to determine seal density–habitat relationships. Extrapolate such relationships to other areas with missing population data to make abundance estimates. However, more research on ecological differences between Pacific and Atlantic bearded seals should be done before extrapolating habitat modelling results.
- Identify unsurveyed areas where surveys should be conducted, prioritising those with substantial catches or sources of mortality.
- Investigate wind chill–haul out interaction during moulting season.
- Consider information on metabolism and moulting process and their consequences for bearded seals in a changing Arctic.
- Investigate effects of predation on bearded seals across their range, to assess vulnerability of Arctic predator-prey systems under climate change.
- Investigate possibilities to obtain population structure/geographic patterns using Close Kin Mark-Recapture. Follow developments of current CKMR projects.

Ringed seal

- Monitor the effects of climate change to understand the drivers potentially impacting ringed seals with a focus on sea ice conditions, to ensure an up-to-date assessment of the ringed seal habitat status.
- Compile biological data of ringed seals for those instances in which it is reported along with catch data for a more comprehensive analysis on population trends.

Harbour and grey seals

- Estimate sustainable removal levels for each stock of grey and harbour seals.

Harp and hooded seals

- Population model(s) used to describe the dynamics of North Atlantic harp and hooded seals, in particular the Greenland Sea, Barents /White Sea should be further developed, including consultation to agree model priors, additional environmental/biological variables into the model structure, especially if new information becomes available. Inclusion of catch at age data is a priority.

White-beaked and white-sided dolphins

- Obtain abundance estimates for white-sided and white-beaked dolphins from all NASS surveys prior to 2007.

RECOMMENDATIONS TO MULTIPLE PARTIES

Recommendations pertaining to Sustainable Removals

White-sided dolphin

- Maintain *total removals* below 750 white-sided dolphins per year across Greenland, Iceland, and the Faroe Islands.

RECOMMENDATIONS TO THE FAROE ISLANDS

Recommendations for Conservation & Management

Harbour and grey seals

- Determine management objectives for the grey seal population in line with the NAMMCO precautionary principles.

White-sided dolphin

- Validate the completeness of the Faroese white-sided dolphin catches, focusing on the apparent lack of juveniles in the catch.

Recommendations for Research with implications for Parties

Harbour and grey seals

- Continue the summer counts for abundance estimations of grey seals, and conduct monitoring of haul-out and breeding sites as well as additional tracking.

White-sided dolphin

- Investigate if there is older (i.e., 1986–1992) existing biological material from the Faroe Islands that could be processed and analysed, and to continue collecting relevant samples to investigate reproduction parameters and age structure.
- Collect eye lenses to explore alternative age-determination methods.
- Collect information from stranded animals, including age, length, and sex data.
- Program satellite transmitters to collect higher resolution dive data at shallow depths to allow aerial survey availability correction factors to be estimated.

Recommendations for Research to Scientists

White-sided dolphin

- Investigate temporal patterns in strandings over a wider area to better understand seasonal movement patterns.

RECOMMENDATIONS TO GREENLAND

Recommendations pertaining to Sustainable Removals

Harbour and grey seals

- According to NAMMCO principles, harbour seal stocks should be at least at 60% of the equilibrium level before any hunting can take place. As the equilibrium level is unknown for all Greenland populations the MSY-level could be used, as it is a close proxy to 60% that can be achieved in a shorter term than the equilibrium level.

- If a harbour seal colony is the closest neighbour to a formerly significant but now abandoned breeding/moulting site, no hunting should be allowed until after the neighbouring breeding/moulting site has been recolonised and an assessment can show a sustainable catch.

Narwhal

- Zero catches should be allowed in all three Management Areas ***(strongly reiterated).***

Beluga

- Zero removals should be allowed, in order to allow for the potential establishment of a new population of belugas in East Greenland, and to avoid removing animals that have potentially originated from the small and protected Svalbard stock.

Recommendations for Conservation & Management

Ringed seal

- Validate catch numbers.

Harbour and grey seals

- All known harbour seal populations should be allowed to increase.

Walrus

- Consider the advice from the 2018 assessment valid until a new assessment is carried out in 2026.

Narwhal

- The next assessment of each Management Area should be conducted in 2026

Beluga

- The next assessment should coincide with the next narwhal assessment.

White-beaked dolphin

- Validate the Greenlandic removals with a special focus on minimising underreporting and estimating struck and lost rates, thus facilitating a full assessment of white-beaked dolphins as soon as possible *(high priority)*.

Northern bottlenose whale

- Validate the reported catches of this species, as there appears to be misreporting.

Recommendations for Research with implications for Parties

Bearded seal

- Obtain tracking data from bearded seals tagged in Greenland and East Baffin Island to get information on stock structures.
- West Greenland and Melville Bay (key hunting areas) as major priority, to get abundance estimates.

Ringed seal

- Carry out a new survey of the Kangia seals in spring 2024 to get a new abundance estimate and report this to the next SC meeting.
- Monitor selected fjord systems with and without catches to assess the effects of hunting, disturbance, and climate change on ringed seals.
- Collect more telemetry and genetic data southwest of Baffin Island and in Lancaster Sound to delineate the boundary between the management areas west of Greenland.
- Carry out aerial surveys to estimate ringed seal abundances in East Greenland.

Harbour and grey seals

- Continue the monitoring of the three known harbour seal populations, together with local hunters.
- Regularly check on previously used harbour seal breeding/moulting sites.

Narwhal

- Deploy satellite tags on animals supplying the spring hunt in Management Area 1, as well as in Northeast Greenland, to investigate the range of the animals supplying the spring hunt.
- Collect biological samples when available from East Greenland, including areas north of Scoresby Sound, to explore genetic connectivity of different stocks.
- Investigate alternative methods to monitor depleted stocks (e.g., using targeted aerial surveys, passive acoustic monitoring, land-based surveys, mark-recapture, collecting incidental observations).
- Conduct targeted aerial surveys of Kangerlussuaq, Nansen Fjord, southern Scoresby Sound, and other reported aggregation areas during summer of 2026.

Beluga

- Collect incidental observations and biological samples when available, to monitor the occurrence of belugas in East Greenland.

White-beaked dolphin

- Determine the stock identity of white-beaked dolphins in West Greenland, using increased genetic sampling and tagging efforts in Greenland.
- To collect life history and age data from Greenland.

Recommendations for Research to Scientists

Bearded seal

- Analyse survey data that included bearded seal sightings in Greenland.
- Determine a suitable availability correction factor for bearded seal surveys.
- Collaboration between groups in the USA, Canada (DFO) and Greenland (GINR) to combine survey data.

Harbour and grey seals

- Improve current knowledge on by-catch of harbour seals and its impact on known populations.

RECOMMENDATIONS TO ICELAND

Recommendations for Conservation & Management

Harbour and grey seals

- Put forward a management plan for both harbour and grey seals, which should include: Re-evaluation of the target population level objective with the new level being based on biological criteria; When setting catch levels, consider total anthropogenic removals (including direct hunt and by-catch); Biennial surveys for both species.
- Make legislation on seal hunting species-specific.
- Continue efforts to reduce by-catch.
- Further develop mitigation measures to reduce anthropogenic disturbances from tourists on harbour seals. Consider restricting access for people to important areas for harbour seals during the breeding period.

Recommendations for Research with implications for Parties

Harbour and grey seals

- Continue efforts to develop population models for both species, assess whether data on biological parameters (e.g., historical population size, changes in carrying capacity over time) from other areas can be used for this, and collect data on biological parameters from Icelandic seals to the extent that it is necessary.

- Continue investigating habitat use of both species using satellite telemetry to help evaluate co-occurrence with fisheries and risk of by-catch.
- Carry out biannual surveys of grey seals.

Harbour porpoise

- Collect data on biological parameters, to facilitate an assessment of the Icelandic stock ***(high priority)***.

White-beaked dolphin

- Make existing and newly collected biological data (age and reproductive information) from Iceland available for the next assessment.

Procedural recommendations

For the Working Group on By-Catch

- Provide an answer to the Secretariat's request as soon as possible, so the WG can proceed with the data call.

RECOMMENDATIONS TO NORWAY

Recommendations for Conservation & Management

Harbour and grey seals

- Management plans should take total anthropogenic removals into account.

Recommendations for Research with implications for Parties

Harbour and grey seals

- Improve knowledge on by-catches by collecting data on species, genetics, and age by collecting jaws from by-caught seals in the reference fleet.
- Collect data on by-catches in recreational fisheries.
- Conduct further tracking studies of coastal seals along the Norwegian coast, to obtain better knowledge on seal movements.
- Continue efforts to implement the Remote Electronic Monitoring (REM) system on Norwegian vessels to estimate drop-out rates and supplement existing by-catch data.
- Complete the analysis of DNA samples from harbour seal pups in Norway to help determine stock structure and propose more scientifically based management units.

Harp and hooded seals

- Tag more harp and hooded seals in the Greenland Sea and the Denmark Strait, and to reanalyse satellite tagging data from the past for both species.

- New pup aerial survey of harp seals in the White Sea (Action by 2024)
- Satellite imaging studies should be undertaken of the White Sea\Barents Sea harp seal population during the pupping season, to suggest possible re-distribution of the seals outside traditional whelping patches (Action by 2025)

Recommendations for Research to Scientists

Harbour and grey seals

- Use reference fleet data to investigate by-catch levels in other fishing gears (e.g., fish traps).
- Improve population modelling of grey seals and incorporate both the by-catch and catch (total anthropogenic removals) in the models.
- Continue the modelling efforts to estimate uncertainty around harbour seal survey methods and incorporate both previous data (back to 2010) and the data being collected during the current survey period (2022–2027).

Harp and hooded seals

- Investigate changes in body conditions of both harp and hooded seals in relation to fishing activity.
- Develop a composite environmental index, including physical and ecosystem parameters.

White-beaked and white-sided dolphins

- Validate the by-catch data from the reference fleets, including estimating drop-out rates, and to estimate total by-catch for relevant fisheries.

PROCEDURAL RECOMMENDATIONS AND REQUESTS

To the Council

Workplans

- The meeting of the Bearded Seal Working Group, originally planned for 2024, should be postponed until sufficient data become available.
- The Walrus Working Group shall be convened in 2026.
- The assessment of harbour porpoise in Iceland shall be held at the earliest in 2026, as there will be no abundance estimate available until then. It is likely that more data will be available

from Greenland by that time, therefore an assessment for all countries could be undertaken that year.

Funding

- NAMMCO and Japan should establish a joint travel fund rendering easier face-to-face meetings, as well as participation in fieldwork and projects, thus strengthening collaboration.
- NAMMCO should provide separate funds to facilitate the initiative of inviting mid- and early-career scientists as external experts and (vice-)Chairs of the SC's subsidiary bodies, ensuring a smooth generational turnover in NAMMCO.

Request for clarification

- The SC is not certain about the motivation to develop a categorisation system for stocks and seeks further clarification of the Council's request.

To the MCs

Harbour and grey seals

- Request R-2.4.2 should be reformulated to match the language of R-2.5.2 and specify that *North Atlantic* refers to *NAMMCO areas* in this context.

Narwhal

- The SC requests guidance from the MCC on the need for continued monitoring and new assessments in light of an imminent extirpation scenario.

Beluga

- The SC requests further guidance from the MCC regarding future assessments of belugas in East Greenland, given that they cannot yet be considered a stock and there are no data on behaviour and movement parameters from which to draw useful conclusions.

White-beaked dolphin

- Redefine Management Areas as: i) West Greenland and Western Atlantic (provisional; pending genetic confirmation); ii) East Greenland and Iceland; iii) Northern Norway and Svalbard; and iv) Southern Norway and North Sea.

White-sided dolphin

- Merge all Management Areas into a single unit, the Central North Atlantic.

To the SC

Collaboration with Japan

- Concerning the project on North Atlantic-North Pacific ecosystems, Luis Pastene shall be the primary coordinator of future discussions, Guðjón Már Sigurðsson shall be the point of contact regarding Icelandic data, and Ulf Lindstrøm and Mads Peter Heide-Jørgensen shall also be included in the project.
- SC members shall compile a list of ongoing collaborative projects related to marine mammals between Japanese and NAMMCO countries' scientists.

Multi-species modelling

- SC members involved in multi-species ecosystem modelling projects should update the list of projects being carried out (provided to SC/27) for the next SC meeting, as well information on the uncertainty or reliability of these models.

Harbour and grey seals

- Plan a joint international workshop to discuss methods of data collection and ways forward to utilize the data for North Atlantic population models of coastal seals in the future.

Harp and hooded seals

- That ICES and/or NAMMCO convene an online workshop on the potential to use multi-species modelling to support the work of WGHARP.

Walrus

- The SC shall request survey results and catch data from Canada, to be presented at the WWG meeting.

Northern bottlenose whale

- A review of northern bottlenose whales could be conducted at SC/31, therefore all members with pertinent data should provide it prior to that meeting.

Terms of Reference

- All future SC meetings should systematically include *Requests to Genetics WG* as an agenda item.

To WGs

Bearded Seal WG

- Prepare a proposal for an in-depth genetic analysis in the North Atlantic area (specifying number of samples needed and where they should be collected) and apply for funding through NAMMCO (Norwegian funding).
- Establish a provisional group to coordinate samples for genetic analyses.

Ringed Seal WG

- Discuss the hypothesis that offshore pack ice populations in Baffin Bay and the Greenland Sea could be supplying the coastal ones, at the next RSWG meeting.

Coastal Seals WG

- The CSWG ToRs should incorporate a specific point regarding the determination of sustainable levels of removals.

WGHARP

- The WG recommends continued communication and collaboration with the regional integrated assessment and ecosystem modelling communities, and bycatch working group (Action by 2025).

Joint NAMMCO-JCNB WG

- At its next meeting, the JWG should provide further monitoring updates on the Mary River Project.

Genetics WG

- The endorsed ToRs of the Genetics WG are as follows:
  i) To review the genetic data that will be used in NAMMCO's species assessments.
  ii) To serve as a consultation body on topics related to genetics for NAMMCO's working groups.
  iii) To detect data and knowledge gaps needed for the assessment of specific species/stocks and provide NAMMCO with advice on how to move forward to fill such gaps
- The first priorities of the WG should be to provide information on the following species, prior to their assessments:
  - **Pilot whales**: examination of the genetic connectivity between different hunting areas (East Greenland, West Greenland, Faroe Islands, Iceland), as well as population structure (if any) across the North Atlantic.
  - **Narwhals**: examination of the genetic discreteness of putative small stocks in East Greenland, as well as population structure between Canada and Greenland.
  - **Belugas**: further examination of the genetic provenance of the animals occurring in East Greenland; examination of the genetic relationship between the West Greenland winter harvest and the Southeast Baffin Island population; examination of stock structure of belugas in the High Arctic, namely those wintering in North Water, those available to the hunt in Northwest Greenland (Qaanaaq), and those available to the fall and winter hunt in West Greenland.

To NASS 2024 SpC

White-beaked and white-sided dolphins

- Emphasise in the NASS 2024 protocols the importance of accurate species identification and ensure that the NASS 2024 data be analysed to provide estimates of abundance in a timely fashion for white-sided and white-beaked dolphins.