Annual Report
2014

North Atlantic Marine Mammal Commission

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COMMITTEES AND OFFICE BEARERS

Members of the Commission		**Councillors**
Faroe Islands	(F)	Mr Ernst Olsen
Greenland	(G)	Ms Amalie Jessen
Iceland	(I)	Ms Ásta Einarsdóttir
Norway	(N)	Mr Ole-David Stenseth

Council

Chairs –	*1992-1995*	Mr Kjartan Høydal (F)
	1995-1997	Mr Halvard P. Johansen (N)
	1997-1999	Mr Arnór Halldórsson (I)
	1999-2004	Ms Amalie Jessen (G)
	2004-2008	Ms Kate Sanderson (F)
	2008-2009	Mr Halvard P. Johansen (N)
	2009-2012	Mr Ole-David Stenseth (N)
	2012.	Ms Ásta Einarsdóttir (I)

Committee on Hunting Methods

Chairs –	*1994-1998*	Ms Amalie Jessen (G)
	1998-2005	Mr Jústines Olsen (F)
	2005-2012	Dr Egil Ole Øen (N)
	2012-2015	Mr Eyþór Björnsson (I)
	2015	Ms Nette Levermann (G)

Committee on Inspection and Observation

Chairs –	*1993-1995*	Mr Einar Lemche (G)
	1995-2005	Dr Egil Ole Øen (N)
	2005-2011	Mr Ole Heinrich (G)
	2011-2012.	Mr Eigil Tofte Bjørvik (G)
	2012-2015	Ms Nette Levermann (G)
	2015…	Ms Ulla S. Wang (F)

Finance and Administration Committee

Chairs –	*1999-2000*	Mr Øyvind Rasmussen (N)
	2000-2005	Mr Einar Lemche (G)
	2005-2009	Ms Ásta Einarsdóttir (I)
	2009-2012	Ms Kate Sanderson (F)
	2012-2014	Mr Einar Tallaksen (N)
	2014…	Mr Ole-David Stenseth (N)

Management Committee (as of 2008 divided into MC for Cetaceans and MC for Seals and Walruses)

Chairs –	*1993-1994*	Mr Kjartan Høydal (F) interim
	1994-1998	Mr Einar Lemche (G)
	1998-2004	Mr Kaj P. Mortensen (F)
	2004-2008	Mr Halvard P. Johansen (N)

Management Committee for Cetaceans

Chairs -	2*008-2012*	Ms Ásta Einarsdóttir (I)
	2012.	Ms Ulla Wang (F)

Management Committee for Seals and Walruses

Chairs –	*2007-2011*	Ms Amalie Jessen (G)
	2011.	Ms Hild Ynnesdal (N)

Scientific Committee

Chairs –	*1993-1995*	Dr Jóhann Sigurjónsson (I)
	1995-1997	Prof. Tore Haug (N)
	1997-2000	Dr Mads Peter Heide-Jørgensen (G)
	2000-2004	Mr Gísli A. Víkingsson (I)
	2004-2005	Prof. Lars Walløe (N)
	2005-2009	Dr Geneviève Desportes (F)
	2009-2012	Dr Lars Witting (G)
	2012.	Dr Þórvaldur Gunnlaugsson (I)

Secretariat

General Secretary	Dr Christina Lockyer
Scientific Secretary	Ms Jill Prewitt
Deputy Secretary	Ms Charlotte Winsnes

SECTION 1 COUNCIL

1.1 REPORT OF THE 23RD MEETING OF THE COUNCIL

3-5 February 2015, Reykjavik, Iceland

1. OPENING PROCEDURES

1.1 Welcome address

The meeting was opened with a welcoming address by the Chair of Council, Ásta Einarsdóttir (Iceland).

Following this, participants (Appendix 3) were welcomed.

1.2 Admission of Observers

The Chair welcomed all observers, noting representatives from Canada, Denmark, Japan, the Russian Federation, and in addition representatives from intergovernmental organisations: the International Whaling Commission (IWC), Northwest Atlantic Fisheries Organisation (NAFO), North East Atlantic Fisheries Commission (NEAFC) and the South East Atlantic Fisheries Organisation (SEAFO).

Regrets had been received from the EC-DG Environment, and the North Atlantic Salmon Commission (NASCO).

1.3 Opening statements

Opening statements were presented by member nations of the Faroe Islands, Greenland, Norway and Iceland; Canada, Denmark, Russia and Japan also made an opening statement. All statements are contained in Appendix 4.

1.4 Adoption of agenda

The agenda (NAMMCO/23/2) was adopted without amendments (Appendix 1). Documents relating to the agenda points are listed in Appendix 2.

1.5 Meeting arrangements

The General Secretary, Christina Lockyer, welcomed everyone on behalf of the Secretariat, and explained a number of housekeeping matters, Secretariat support available, the availability of a small meeting room for use by delegates and committees during the week, the schedule of the meeting programme and arrangements for a social event, a dinner, to be hosted by the Icelandic Ministry at the Radisson Blue Hotel Saga.

1.6 Invited speaker

A presentation entitled *The Hunting of Marine Mammals: Conflict, Consensus and a Moral Code* was given by Henry Alexander Henrysson, (Centre for Ethics, University of Iceland). A summary of this presentation is provided in Appendix 5.

There followed several questions relating to both ethical, practical and managerial matters. Henrysson was thanked for his thought-provoking and excellent presentation.

2. FINANCE AND ADMINISTRATION

2.1 Report of the Finance and Administration Committee (FAC)

The Chair of the FAC, Ole-David Stenseth (Norway), presented the report of meetings held during 2014 (NAMMCO/23/4) and 2015. There had been a meeting in January 2015 in Copenhagen where the accounts and budget had been discussed. He explained that the budget 2015 and draft budget 2016 would remain open until after the conclusion of the meetings of the Management Committees and their recommendations and requests were available.

Stenseth reported that the audited accounts from 2014 had been accepted without issues, and that there was a

surplus of 337,000 NOK. He noted that it had been agreed that with respect to signatory authority for the audited accounts, the responsibility should be given to the General Secretary.

Previously, in 2013, the General Reserve had been discussed and the FAC had recommended that NAMMCO should aim for a General Reserve representing 10% of operating expenses – presently estimated to approximately NOK 600,000 – within 5 years (2018). It was thus recommended that the budget should be determined according to this plan in order to build up the General Reserve.

In reporting on T-NASS 2015, difficulties achieving financial goals had been experienced. External funding was now being sought and any results will be reported as soon as possible, the earliest being in March 2015.

A number of problems had been encountered with the Host Agreement, such as the Diplomatic ID numbers provided for staff members from outside the EU, which created difficulties in utilising the social benefits negotiated in the Host Agreement. Clarification was now needed on such items.

In relation to staff matters, a change in the existing pension scheme had been approved, in line with new regulations within Norway.

The NAMMCO website incorporating the stock status sites were being upgraded.

Amendments to the Rules of Procedure regarding membership of the Scientific Committee, allowing participation of 6 scientists per country at meetings, had been approved but required Council endorsement.

The Chair of Council invited comments to the report, and subsequently the **report was accepted and its recommendations and conclusions endorsed**.

2.2 Audited accounts 2014

The Chair highlighted that the 2014 accounts *(*NAMMCO/23/4.1) had closed with a surplus of 337,000 NOK. In addition the auditors' report had been received without further comment, so that the accounts were in good order.

Comments:

The accounts (NAMMCO/23/4.1; Appendix 6) were approved and **adopted** by Council.

2.3 Budget 2015 and Draft Budget 2016

The Chair introduced the 2015 budget and draft budgets for 2016 (NAMMCO/23/4.2). Explanations of the budget lines and the rationale for determining them were presented.

The special focus was on rebuilding the General Reserve which should be increased to a level of 10% of the annual operating budget in the next 5 years.

Comments:

The Council **adopted** the budget 2015 and the draft budget 2016 as contained in NAMMCO/23/4.2 revised.

2.4 Other business

None.

3. SCIENTIFIC COMMITTEE

3.1 Report of the Scientific Committee (SC)

The Chair of the Scientific Committee (Thorvaldur Gunnlaugsson, Iceland) introduced relevant parts of the SC report **(**NAMMCO/23/5; Section 3) relating to information on Cetaceans. Regarding Working Group (WG) activities, the Catch Allocation WG on narwhal and beluga will meet again this year in March. The Large Whale Assessment WG was postponed because of the ongoing work in the IWC.

By-catches of porpoises in Iceland had decreased in the last decade. In the period 2009-2013, an average

estimate of 2,000 animals per year was reported. By-catch of harbour seals was estimated 705 in 2013, and of grey seals 140 in 2013.

Reporting on the Council requests to the SC:
R.3.1.7 relating to fin whale assessment was pending completion of the IWC RMP work to be completed at IWC 66. Testing with 60% tuning is to come. A shift in distribution of fin whales around Iceland had been noted with movement further south later in the season.

R.3.3.4 relating to common minke whale assessment was pending the meeting of the Large Whale Assessment WG in late 2015. The Central stock however was lower than previously.

R.3.4.11 relating to narwhal and beluga assessment, there had been much progress on knowledge of distribution from results of satellite tagging.

R.3.4.9 relates to the Disturbance Symposium focusing on narwhal, beluga and walrus, and plans for this are going ahead for a scheduled meeting in autumn 2015.

R.3.7.2 relating to killer whales in West Greenland awaited more information. The SC had received no catch information on killer whales from Greenland. Photo ID studies had matched animals linking Iceland and the Shetlands. A switch in diet of killer whales had been noted in the Norwegian Sea.

R.3.10.1 relating to a comprehensive assessment of harbour porpoises throughout the Northeast Atlantic awaited more information from the Faroes and West Greenland on catches and abundance but may be possible after the completion of NASS 2015 (renamed this meeting from T-NASS 2015).

Studies of genetic estimates from recapture indicated that sightings of bowhead whales off West Greenland can be very negatively biased.

For blue whales, an increase had been reported around Svalbard. Biopsy sampling was ongoing around Iceland.

The Planning group for (T-)NASS 2015 had met during 2014 and currently the proposed surveys included pilot whales around the Faroes, fin whales southwest of Iceland, and common minke whales in the central area of the North Atlantic and Jan Mayen areas. Here the survey design executed by Iceland would be based on the use of mackerel boats and coastal survey vessels; however, the survey would use the Norwegian method on board. Aerial surveys were also planned. Drones were being tested for use in surveying pilot whales around the Faroes.

Comments:
Norway noted that since the SC had met, there had been an update of the (T-)NASS plans. Norway was also concerned over the by-catches in Norway, which were very high.

The vice-Chair of the Scientific Committee (Tore Haug, Norway) then introduced relevant parts of the SC report **(**NAMMCO/23/5) relating to information on Seals and Walrus. He noted that involvement with the ICES Harp and Hooded seals Working Group (WGHARP) had continued (formerly the ICES/NAFO WG), and it had been proposed that a stronger and more formal affiliation with ICES should be sought in this WG. The Secretariat reported that subsequent correspondence with ICES had now resulted in the start of formalising official cooperation between ICES and NAMMCO in this working group (NAMMCO/23/INFO 01). This is also reported later under item 10.1. Seal management in Canada was currently local since the ICES-NAFO WG had dissolved, and been overtaken by WGHARP. However, now that NAMMCO will become an official partner in this WG, Canada may now revert to WGHARP for advice. Terms of Reference would be developed to include fisheries interaction and hunting in the future.
Haug reported on environmental issues of concern regarding gillnet by-catches of both harbour porpoises and also seals. The by-catches amounted to higher takes of animals than actual whaling off Norway. The By-catch WG would be scheduled back to back with the WG on Coastal Seals during 2016.

There were reports from Russian colleagues on receding ice that had resulted in reduced pupping production in the White Sea. Harp seals in East Canada now had a pup production less than half that of 4 years ago.

Norway reported a reduction in pup production also in the Northeast Atlantic. Harp and hooded seals were dependent on ice for breeding, and in Svalbard there were big problems.

In Norway, grey and harbour seals were surveyed annually in different areas, with a comprehensive abundance estimate every 5 years.

For walrus, there were 3 stocks in Greenland. There had been modelling difficulties *e.g.* for the Baffin Bay stock, but now there was a recent survey to add information that may enable a revised assessment.

3.2 Trans-North Atlantic Sightings Survey (T-NASS 2015) – now NASS 2015

There was a brief presentation of the most current status of T-NASS 2015 (NAMMCO/23/6) by Jill Prewitt.

The SC recommended that the "T" be removed from T-NASS, given that there will not be coverage in the West Atlantic. The NAMMCO project remains the same, but will be called NASS-2015 going forward.

Funding

The Faroe Islands have received approval for the requested funds for both the national and extension surveys for pilot whales. Iceland has received approval for ¾ of the requested funds for both the national and extension surveys. Norway reported that the funds are available to conduct their planned mosaic survey (the national survey) but not the extension area of Jan Mayen. Greenland will likely not have more information on funding before June 2015.

A proposal for full funding of the TNASS-2015 extension surveys will be submitted by NAMMCO to the Norwegian Ministry of Foreign Affairs under the scheme "Nordområdesatsingen" before the end of February 2015. The decision on funding is expected in March. Norway and Greenland expressed that it may still be possible to plan and conduct the extension surveys with this short funding notice, but that survey platforms (ships and aircraft) may not be available. The Faroe Islands and Iceland will continue as planned regardless of the late funding decision.

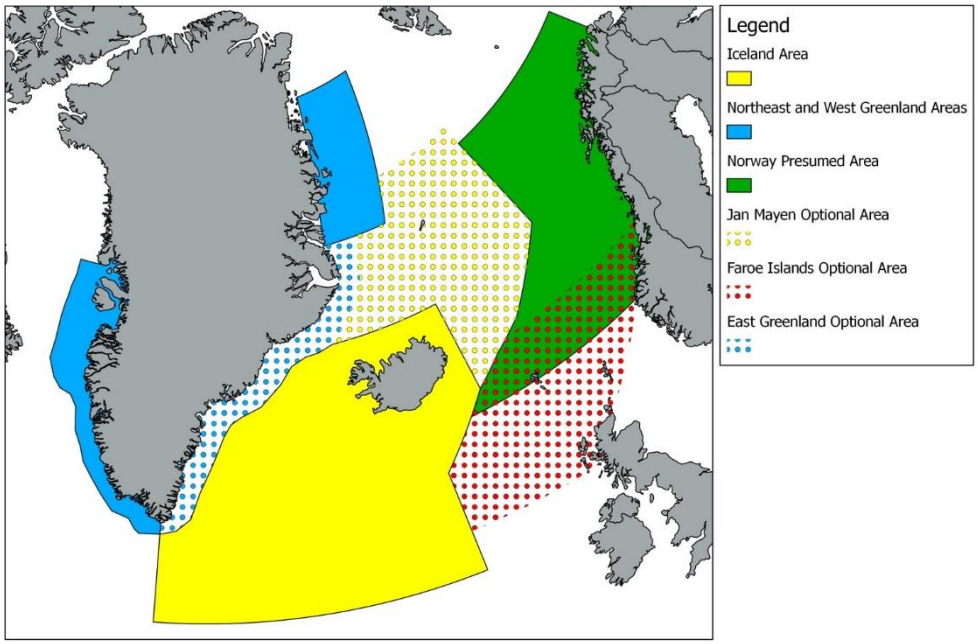

Figure 1. Extension of the T-NASS 2015 and associated surveys. The size of the areas is estimated to be 235,529 km^2 for Northeast Greenland, 726,044 km^2 for the Jan Mayen area, 2,860,193 km^2 for the Iceland area, 934,722 km^2 for the Norwegian area, ~768,235 km^2 for the Faroe Island area, 233,659 km^2 for the East Greenland area and 225,285 km^2 for West Greenland.

Equipment Purchases
A few key pieces of equipment that require time for testing have been purchased. These include 1) a drone and camera for the pilot whale surveys in the Faroes, 2) a voice and data recording system and 3) a device for measuring angles; both 2) and 3) are for the aerial surveys in Greenland and Iceland. These were purchased using the remaining 2014 funds for this project.

Survey Area
The proposed survey areas remain the same as the proposal presented previously (Fig. 1), with the exception of the blue solid block in Northeast Greenland, which will not be conducted.

Comments:
There was agreement to rename the project NASS-2015. Some parts of the survey would go ahead in 2015 as planned but the remaining parts might be postponed. Final decisions would depend both on funding application through the Norwegian proposal being successful and also whether ship time and other logistics would be feasible at reduced notice.

3.3 Priorities and Work plan of the Scientific Committee (SC) in 2015-2016

The Scientific Secretary, Jill Prewitt, reported on the schedule of WGs recommended by the SC, and these are listed below.

Working groups

1) Walrus Working Group (WWG)
The WWG should convene a one-day meeting in March 2015 to update advice on sustainable takes of walruses in the Baffin Bay stock. If feasible the meeting could be conducted as a teleconference and participants would include Wiig (Chair), Witting, Heide-Jørgensen, Hansen, Lydersen, Acquarone, Ugarte and Stewart.

2) JCNB/NAMMCO Joint Scientific Working Group
The next JWG meeting will be held in March 2015 in Ottawa, Canada. One of the tasks at the start of the meeting is for the Catch Allocation subgroup to complete the model. The main meeting will update the assessment of narwhal and belugas.

3) Large Whale Assessment (LWA WG)
A Large Whale Assessment meeting was previously planned for the fall of 2014. This was postponed to the fall of 2015, awaiting work to be completed by the IWC on the fin and common minke whale *Implementation Reviews*. The NAMMCO LWA WG will plan on meeting in the fall of 2015 in hopes that the work on the IWC SC will be complete.

4) Disturbance Symposium
Planning for a Disturbance Symposium that will deal with the impacts of human disturbance on narwhal, beluga and walrus is underway. Preliminary plans are to hold the meeting in early October 2015 in Copenhagen. Kit Kovacs has agreed to Chair the meeting and Mads Peter Heide-Jørgensen is the NAMMCO Convenor. The primary objectives of the Symposium will be to 1) present an overview of the information currently available; and 2) make recommendations for both restrictions of anthropogenic disturbances and future studies. The conclusions will be available to stakeholders shortly after the meeting in the form of a report with specific recommendations. Participants may also be invited to submit papers stemming from the symposium for publication in a special volume of the *NAMMCO Scientific Publications* series.

Several external experts will need to be invited. A first announcement of the meeting will be sent to prospective participants soon. Prewitt reported that the University of Leeds had only recently informed about their own interest to hold a meeting on a similar topic with many of the same invited experts, but were interested in cooperation and liaison with NAMMCO. The NAMMCO SC and Symposium planning group would be consulted on this, as well as look into funding sources.

The following meetings are planned for early 2016:

5) By-catch WG

With new information available on by-catch, the SC recommended convening a By-catch Working Group. This would be a technical WG that could focus on discussing the methods that are being used to collect the data and extrapolate the results, and decide if further work is required.
Suggested Terms of Reference:
By including external expertise from fisheries and marine mammal science, the
WG would

1. Identify all fisheries with potential by-catch of marine mammals
2. Review and evaluate current by-catch estimates for marine mammals in NAMMCO countries.
3. If necessary, provide advice on improved data collection and estimation methods to obtain best estimates of total by-catch over time.

The SC suggested that the By-catch WG could meet just prior to the Coastal Seals WG and recommended that Geneviève Desportes be appointed convenor.

6) Coastal Seals
A Coastal Seals WG (Chair: Kjell Tormod Nilssen) meeting has been tentatively scheduled for February 2016 to address R-2.4.2 and R-2.5.2.
The Terms of Reference for the meeting will be for the WG to:

1. assess the status of all populations, particularly using new abundance estimate data that are available from Iceland and Norway.
2. address by-catch issues (grey seals) in Norway, Iceland, and the Faroe Islands
3. re-evaluate the Norwegian management plans (which have been already implemented) for grey and harbour seals.

Work Plan of the SC for 2015 and 2016:
After discussion in the FAC and Management Committees regarding the requests from Council and the needs of members, in relation to the budget, the work plan was **approved** for the SC in 2015 with indications of priorities in 2016.

3.4 Other business
The amendment to the Rules of Procedure (NAMMCO/23/13) was **approved** by Council.

4. NATIONAL PROGRESS REPORTS

National Progress Reports (NPR) had been received from member countries (NAMMCO/22/NPR-F, NAMMCO/23/NPR-G, NAMMCO/22/NPR-I, NAMMCO/22/NPR-N; (Section 4) and also from observer countries Canada, Japan, and the Russian Federation, all of whom were thanked for their contributions.

Comments:
Greenland commented that there was a need for structure in delivering the NPR. In the future, when the NAMMCO Secretariat requests members to submit NPR reports, there should also be a copy of the request sent to the contracting contact members to ensure that there is a good liaison and delivery of the NPR in good time.

5. MANAGEMENT COMMITTEE FOR CETACEANS

5.1 Report of the Management Committee (MC) for Cetaceans
The Chair of the Management Committee for Cetaceans, Ulla S. Wang (Faroe Islands), presented the report (NAMMCO/23/7; Section 2.1). Past requests for advice from the Scientific Committee and their status were discussed for the species considered on the agenda, and also past proposals for conservation and management. There was one new proposal for conservation and management. There four new (amended) requests for advice from the Scientific Committee (see item 5.2 below).

There was discussion on the planned **Disturbance Symposium** addressing request R-3.4.11. Presently narwhal, beluga and walrus are on the agenda. The SC members attending this meeting discussed *ad hoc* a recent offer from a research group from the University of Leeds in the UK to join forces in planning the Disturbance Symposium. This group, and the members of the Disturbance Symposium Steering Committee,

recommended to the MC that the Disturbance Symposium Steering Committee discuss with the group from the University of Leeds whether their objectives overlap with the NAMMCO objectives to warrant collaboration on the symposium.

The MC endorsed this suggestion to broaden the scope of the meeting, and continue to discuss the possibility of collaboration with the University of Leeds group.

Concerning T-NASS 2015, the MC also noted the interval between sightings surveys has exceeded the recommended interval (6 years) and is approaching the maximum recommended (10 years) and hopes that the now renamed **NASS-2015** will continue as scheduled in 2015. The MC notes that results from NASS-2015 will take some time but hopes that results will come as soon as possible.

Agenda items in common with the MC for Seals and Walrus are discussed under item 6 below.

Proposals for Conservation and Management

There was an amendment to one very old proposal for conservation and management, **3.5.1 regarding northern bottlenose whale**. The Faroes noted that the wording of the proposal is incorrect - there is not a direct traditional coastal drive hunt, but rather stranded animals that are found alive are permitted to be taken. The MC **endorsed** the changing of the wording in the proposal to remove "traditional coastal drive hunt" and replace this with "strandings".

With respect to proposal **3.3.6 regarding narwhal**, the MC strongly **recommends** that "struck and lost" data be collected from all areas and types of hunt and that all "struck and lost" animals be included in the advice.

Comments:

In conclusion, the Council **took note of the report and accepted its recommendations** to member nations.

5.2 Recommendations for requests for advice from the Scientific Committee

New requests and amendments:

R-3.1.7 concerning fin whales was amended as requested by Iceland to include a 0.6 tuning level.
R-3.2.4 concerning Greenlandic humpback whales should be reiterated because of the cessation of the 2009-2015 scientific advice for the quota.
R-3.4.4 concerning common minke whales should now include an application of a 0.6 tuning level.
R-1.7.11 concerning T-NASS 2015 (now NASS 2015) should be reiterated and amended to include humpback whales. The request now reads as follows: "Once the survey has been completed, the Scientific Committee is requested to develop estimates of abundance and trends as soon as possible, with the primary target species (fin, common minke, humpback and pilot whales) as a first priority, and sei whales as a secondary species."

The Council **noted** these amendments to requests and **endorsed** them. It is anticipated that all above requests will be addressed during 2015 through the Large Whale Assessment WG.

5.3 Other business

None.

6. MANAGEMENT COMMITTEE FOR SEALS AND WALRUSES

6.1 Report of the Management Committee for Seals and Walrus

The Chair of the Management Committee for Seals and Walrus, Hild Ynnesdal (Norway), presented the report (NAMMCO/23/8; Section 2.2). Past requests and their status were discussed for the species considered on the agenda, and also past proposals for conservation and management. There were no new proposals for conservation and management, and one new request replacing older requests for advice from the Scientific Committee.

Regarding walrus, the MC **endorsed** the SC recommendation to update advice on sustainable takes of walrus from the Baffin Bay stock now new information was available, and that this be organised through a one-day teleconference.

In a joint session of both Management Committees for Cetaceans, and Seals and Walrus, note was taken of the report from the SC with respect to marine mammals – fisheries interactions, and that requests R-1.1.2 and R-1.4.1.to 1.4.6 were all outdated, and that request R-1.1.5 took the place of R-1.1.3. The series of requests R-1.4.1 to 1.4.6 are all regarding the economic aspects of marine mammals-fisheries interactions. The SC regards these requests also as outdated. Should the MC still like these issues addressed, a new, more specific request should be drafted. The SC also noted that socioeconomic impacts are included in a large-scale ecosystem modelling project (MAREFRAME) which includes marine mammals in Icelandic and adjacent waters. The MC further agreed to recommend to Council the request that the SC review results from MAREFRAME project as described above.

Concerning Environmental questions, R-1.5.1 (radioactive material entering the North Atlantic ecosystem), was considered outdated by the SC and this was endorsed by the MC.

Comments:
Greenland reported that with respect to walruses, "Struck and Lost" was estimated to be 15% in Baffin Bay, and in the Qaanaaq management area the struck and lost rate is placed to 3 % after a consultation with hunters and decision made by the Cabinet. Greenland also informed that the report on traditional and ecological knowledge of walrus will be reported at the next NAMMCO meeting.

The Council noted the report and its recommendations to member nations.

6.2 Recommendations for requests for advice

R-1.4.7 One new request was tabled under Economic Aspects of Marine Mammal-Fisheries Interactions. This requested the "SC to undertake a review of the large-scale ecosystem modelling project MAREFRAME which included marine mammals in Icelandic and adjacent waters, on completion."

The Council endorsed this request.

6.3 Any other business

Trade Issues and the EU Ban on importation of sealskin.
This issue was discussed in the Management Committee for Seals and Walruses. However, Leif Fontaine of KNAPK in Greenland gave a statement regarding Inuit Sila against the seal ban (Appendix 7). He noted the coastal peoples' right to hunt seal, and that since the EU ban, sealing was on the verge of collapse as this was a vital source of income. There had been a 90% loss in the market worth 5 million DKK. Seal hunting was sustainable in the N. Atlantic and had been given support from the Government of Greenland, Copenhagen Fur and Great Greenland companies. All were united in the strategy against the ban and anti-sealing campaigns, including the Greenlandic political parties. It was necessary to change public opinion, and re-establish sealing as a normal resource and improve the Inuit way of life. Inuit peoples of Canada, Russia and Alaska were also united in this matter, and supported by Nunavut and Iqaluit and the government in Ottawa in Canada. As the ban affected peoples' livelihoods, funding would be used to promote a strong campaign within the EU and voice against animal rights organisations, demanding compensation for damage to businesses and hunters, and restore confidence in Greenlandic sealskin as a product.

Comments:
Denmark stated its support of Greenland in this action. Sealing was a legitimate activity to be recognised.

7. HUNTING METHODS

7.1 Report of the Committee on Hunting Methods

The former Chair of the Committee on Hunting Methods, Eyþór Björnsson (Iceland) presented the report (NAMMCO/23/9; Section 1.2). Two meetings took place in 2014 including a telephone meeting and the annual meeting in November 2014. Updates of hunting regulations were reported by the Faroes including use of the spinal lance where there was a revised dimension specified for the blade. The traditional knife is only to be used for dissection and bleeding after the kill. Greenland reported a new Executive Order for large whales. Nothing new was reported in Iceland nor Norway.

Time to Death (TTD) data were collected in Norway for minke whales in 2011 and 2012, and data on time to irreversible unconsciousness / TTD in seals in 2013 and 2014; and in Iceland, fin whale TTD data were collected in 2014. There are no current plans for TTD data collection in the Faroes.

In 2012, Council endorsed plans for a TTD data expert group meeting, and it was noted that future voluntary reporting of TTD data to the Committee should be modelled around the Norwegian manner of presenting these kinds of data. The Hunting Committee was also tasked to organize a seminar to focus on data collection, analysis and presentation. Responding to this the Committee will now organise a practical hands on seminar on analysing and presenting TTD focusing on Greenlandic and Icelandic datasets, just prior to a TTD expert group meeting.

Comments:
Norway expressed concerns about the practical issues of TTD information at such a seminar where there would be a need for specialist knowledge and also oversight.

Japan indicated a wish to present data at the TTD expert group meeting. The Chair responded that invitations would be issued to Japan, Russia, the USA and Canada to present TTD data.

The new Chair of the Committee on Hunting Methods – Nette Levermann (Greenland) – reported that the seminar and the expert group meeting would be planned back-to-back with the Scientific Committee meeting.

Council noted the report and **endorsed** the recommendations from the Committee on Hunting Methods.

7.2 Manual on Hunting of Marine Mammals

Nette Levermann (Greenland) presented the Manual on hunting of small whales in Greenland (NAMMCO/23/14). Like the other manuals, the set-up is with a main focus on safety information and square boxes highlighting the most important information from that section.

There is a section on the anatomy in relation to the killing, followed by a description of the hunting methods and equipment used. Illustrations are included showing the target sites for the 6 species hunted. Finally a section describes improvements made in the hunting gear.

The plan is to send this manual together with an introductory letter to all who have reported catches of a small whale in the last 4-5 years, in total 2,000 manuals. This now concludes the production of all manuals on whale hunting and killing. All manuals are online and available in English in addition to different languages (Greenlandic, Faroese, Norwegian).

Comments:
The meeting expressed satisfaction in the completion of this important work.

7.3 Other business

None.

8. THE JOINT NAMMCO CONTROL SCHEME

8.1 Report of the Committee on Inspection and Observation

The Chair of the Committee on Inspection and Observation, Nette Levermann (Greenland), presented the report (NAMMCO/23/10; Section 1.3) from 2014.

Regarding monitoring, the Faroe Islands do not have national inspectors although the hunt is regulated through the "Sysselman" and the foremen leading each hunt, and this ensures the control and monitoring.
Norway confirmed that the electronic monitoring system (the blue box) continues to collect hunting data on each whaling vessel, and that inspectors are only used in cases of possible infringements. In 2014 no inspectors had been active on the whaling vessels. 23 licenses were given for the 2014 season of which 21 vessels participated which is an increase of 3 boats from 2013. The hunting period was from 1/4-25/9, no infringements reported.

With respect to sealing, there is a 100% control and monitoring effort as it is mandatory to have inspectors on board all vessels. Three vessels were active in 2014 in the West Ice, mainly in Greenlandic waters. The hunting season was from 10 April to 30 June but all vessels were back before 17 May. No infringements were reported.

Iceland informed that they had two inspectors on the fin whale hunt during two trips over a 7 days period. Two inspectors were also monitoring the common minke whale hunt for 4 days. Iceland collected TTD data in the 2014 season including post-mortem examinations. Due to bad weather and technical problems with the hunting vessels, it was only possible to get enough data on the fin whale hunt.

Greenland informed that the wildlife officers as part of the regular national control have followed and controlled large whale hunts and beluga and narwhal hunts. The coverage is normally less than 2% of the hunting activities on large whales. In 2013, there were 6 reported infractions of national legislation on large whales. The infractions were related to the use of common minke whale grenade for fin/humpback whale and cold harpoon used for common minke whale as secondary weapon.

Member countries were asked to supply the Secretariat with information on qualification requirements of the national inspectors. Based on these inputs the Secretariat will compile an overview that will be circulated together with all other documents in the nomination process related to the Observation Scheme every year.

Council noted that Ulla Svarrer Wang (Faroe Islands) was elected as new chair and that the vice-Chair will be held by Norway.

Council noted the report from the Committee on Inspection and Observation.

8.2 Report of the Observation Scheme in 2014

The Deputy Secretary, Charlotte Winsnes, presented NAMMCO/23/15 – the report from the Secretariat. Whaling and sealing in Greenland had been the focus of the observation scheme in 2014. One observer was contracted for the period 17 August to 5 September. No violations had been observed, and reports had been submitted to the Secretariat. Poor weather had hindered observation, but also there had been a technical communication issue between observer and hunters.

Comments:

Norway commented that technical communication problems should be addressed in the future.

Greenland also commented on how to improve communication. Help from the Greenlandic authorities might be sought, especially with language difficulties.

8.3 Observation planned in 2015

Referring to NAMMCO/23/10, Winsnes reported the scope for 2015 is whaling in the Faroe Islands, budgeted with NOK 200,000. The suggestion is to send two observers, one from Greenland and one from Iceland, each covering different 25 days periods. Based on available information on pilot whale drive statistics, the high season is May to September – 5 months or 150 days. The suggested observation effort represents 1/3 of the high season and the Committee on Inspection and Observation had considered this to be good coverage.

8.4 Other business

None.

9. ENVIRONMENTAL QUESTIONS

Climate change and ice retreat

Norway reported on the plight of hooded and harp seals – both are ice-breeding seals. Dramatic ice retreat has been recorded since 1870 in the N. Atlantic, and now the ice edge is right close to the coastline. The effect on seal populations – now close to shore, is that polar bears are a threat, and are changing their diet from ringed to harp and hooded seals. The same story occurs in Eastern Canada. Exposure of seals on ice floes favours killer whale predation, and also pups cannot survive cold in the water if they tumble off floes. Seal mothers may also migrate northwards and then come into contact with polar bears. In Svalbard, ringed and bearded seals use ice as substrate while feeding. Now the seals are experiencing problems and instead of sea ice, seals

depend on glacial ice floes. Bowheads, belugas and narwhals are also exposed to ice changes. These species are now found off Svalbard, and join in competition with existing species. Oil and gas and shipping routes are affected by ice retreat and thus encounters with whales are more frequent. Noise arises from seismic activity and this should be a topic for the scheduled Disturbance symposium. The present increase in bowheads off West Greenland has been surmised as the result of overflow from Alaska, but this is uncertain. Common minke whale migration has also been linked to the capelin distribution shift off Iceland.

10. EXTERNAL RELATIONS

The General Secretary introduced (NAMMCO/23/11) and presented summaries of 12 observer reports from attendance at meetings of the IWC 65th Annual Scientific Committee meeting, 12-24 May 2014, Bled, Slovenia, the IWC 65th Commission meeting and Sub-Committee meetings/ WG Whale killing and Associated Welfare Issues, 11-13 Sept. 2014, Bernardin, Potoroż, Slovenia, the NASCO 31st Annual Meeting, 3-6 June 2014, Saint Malo, France, the NEAFC 33rd Annual Meeting, 10-14 Nov. 2014, London, UK, the NAFO 36th Annual Meeting, 22-26 Sept. 2014, Vigo, Spain, the 4th Meeting of the Arctic Council SCTF, 30 Sept.-2 Oct. 2014, Tromsø, Norway, the IWC Workshop on Impacts of Increased Marine Activities on Cetaceans in the Arctic, 6-7 March 2014, Anchorage, USA, the UN-FAO Global Summit - Global Oceans Action Summit for Food Security and Blue Growth, 22-25 April 2014, The Hague, Netherlands, the 4th PAME Ecosystem Approach to Management Workshop: Integrated Ecosystem Assessment (IEA), June 16-18 2014, Vancouver, Canada, the 11th Meeting of the South East Atlantic Fisheries Organization (SEAFO-X), 1– 6 December 2014, Windhoek, Namibia, the Regional Fishery Body Secretariats Network (RSN-5), 7 June 2014, Rome, Italy, and the Thirty-first Session of the FAO Committee on Fisheries (COFI 31), 9 – 13 June, Rome, Italy.

Lockyer noted the importance of NAMMCO's presence at such meetings, both from the point of view of visibility and also for making interventions. She thanked observers for their contributions where the Secretariat had been unable to participate.

Comments:
Greenland also noted the importance of visibility of NAMMCO at such meetings, and reported on the activities of the Arctic Council WG CAFF where the ringed seal had been referred to. Future NAMMCO involvement might likely be important here, should the ringed seal be brought up again as a topic.

Loftsson (Iceland) reported on the notice of the third Arctic Circle Assembly meeting scheduled for 16-18 October 2015 in Reykjavik, Iceland. The Arctic Circle meets annually and is a high profile meeting with government representation. The meeting in 2015 would include breakout sessions and proposals for submissions were welcomed with a deadline 1st June 2015.

10.1 Cooperation with international organisations

ICES
Lockyer reported on the formalisation of cooperation between NAMMCO and ICES regarding the seal WG, WGHARP, which was the successor to the former ICES/NAFO WG on harp and hooded seals (NAMMCO/23/INFO 1). This was a very desirable step and recognition of NAMMCO's important role in seal scientific and management advice.

10.2 Other business

None.

11. INFORMATION

The General Secretary presented NAMMCO/22/12. The document reported on attendance by Secretariat members at two scientific meetings: the 28th Conference of the European Cetacean Society, 5-9 April 2014, Liège, Belgium, and the 8th Conference on Marine Mammals of the Holarctic, 22-26 September 2014, St Petersburg, Russia – the first time NAMMCO had attended one of these biennial meetings. Such scientific meetings are important for the Secretariat to maintain scientific networking and contacts and keep abreast of new research. The St Petersburg conference was also an opportunity to secure cooperation with the Russian Marine Mammal Council in co-convening the workshop/seminar on Global review of Monodontids. The rationale for such cooperation was based on the following proposals -

- The proposal is for a 3-day scientific symposium - workshop, with invited experts on monodontids, and about 50 international participants
- The focus of the scientific symposium - workshop would be a comprehensive review of all aspects of the biology and study of belugas and narwhals in all regions where they occur
- The scientific symposium-workshop should be held in conjunction with the 2016 Conference on Holarctic Marine Mammals – before or after the event
- The rationale being that this conference is attended by many Russian experts researching belugas, and would attract a high attendance of relevant experts
- External funding would be sought to support attendees internationally as well as from within Russia, and an organising committee has already been established
- A scientific report would be produced after the event, to be published online together with presented scientific papers in the free access NAMMCO Scientific Publications Series site at http://septentrio.uit.no/index.php/NAMMCOSP/index

The final item in NAMMCO/23/12 was notice of the Norden- and Faroese Government-sponsored International Conference on Growth in Blue Bioeconomy, to be held in Tórshavn, Faroe Islands, 2-3 June 2015. This conference may be particularly relevant for NAMMCO in respect of marine mammals and food security.

11.1 Scientific Publications

The Scientific Secretary summarised the activities in the online publications. The journal website (http://septentrio.uit.no/index.php/NAMMCOSP/index), as of 30 January 2015, has had almost 4,000 visitors from 97 countries.

The *Walrus of the North Atlantic* volume 9 has now been finalised with all papers now online, and has been published in hard copy. A copy has been distributed to each delegation. Additional copies are available upon request from the Secretariat. The volume 10 on *Age estimation of marine mammals with a focus on monodontids* has 8 papers published online as "online early versions". Additional papers will be online soon. Professional typesetting of completed papers will begin shortly. All previous volumes are now accessible on the journal website.

The Scientific Committee (SC) had discussed the future of the *NAMMCO Scientific Publications* series. Ideas for future volumes include papers from the scheduled Disturbance Symposium, Global Review of Monodontids, and unpublished T-NASS papers.

The SC had also discussed whether the journal should be opened up for non-themed papers. This would likely involve additional workload for the Editorial Board, as papers would need to be assigned to an editor for the peer review process. The Scientific Secretary will discuss this with the Editorial Board soon and will report back to the SC.

Comments:

Greenland expressed satisfaction in this new walrus publication.

11.2 Progress on Stock Status list – website

The General Secretary reported that the second phase contract with GDNatur, Denmark, was completed, meaning that the entire project was now finished. The species for which a comprehensive account is now available include fin, common minke, beluga, pilot whale, narwhal, ringed seal and walrus. Remaining species have a brief general account. The information had initially been compiled on a specially designed Google webpage, but is now being integrated into the upgraded NAMMCO website (see below item 11.3). Work is not finalised but is expected soon in 2015.

11.3 Upgrading of the NAMMCO website

The General Secretary reported that complete upgrading of the NAMMCO website had been ongoing. The new site is expected to go online soon in 2015, together with the stock status information (above 11.2).

12. ANY OTHER BUSINESS

12.1 Marine Mammals and Food Security

A report on progress was presented by Amalie Jessen (Greenland) who was the Chair of the planning group for this topic. The planning group had met in January 2015 and set specific goals for the future development of this project which had received funding from NORDEN.

Jessen recalled the Ministerial Meeting in 2012 where there had been an emphasis on increased focus on marine mammals as a food resource. A Planning Group was established at NAMMCO 22 to advance this theme. As a result the Planning Group had outlined two main parts – firstly, production of a background document reviewing and compiling the existing material on the topic, and secondly, to communicate the message. No conference has been scheduled. The approach for the background document was to compile and structure it in a way that it could be dynamic so that updating would be easy. The main themes to be addressed were:

- Stock status
- Resources used today
- Food security in general in relation to human population growth
- Ethics
- Health aspects
- Hunting methods, efficiency, safety, etc.
- Ecological aspects
- Creative food
- Commercial marketing.

The second part required a strategy involving expert help, to develop the message.

The agreed schedule was for the Secretariat to prepare a first draft of the background documentation by June 2015 and furthermore, to look into funding resources.

12.2 Notifications by Japan

Japan informed the meeting about two important scheduled events.

1. Proposed Plan for the New Scientific Whale Research Program in the Antarctic Ocean (NEWREP-A). A workshop to address this planning would be held in February 2015, and Walløe, representing Norway, would be participating in this workshop.
2. Meeting on the Sustainable Use of Marine Living Resources including Cetaceans, to be held in Tokyo in autumn 2015. Japan noted that this topic was increasingly becoming a world focus because of the issue of food security, but with negative attitudes towards cetacean use.

13. CLOSING ARRANGEMENTS

13.1 Elections

Norway proposed Iceland (Ásta Einarsdóttir) to continue one term more. Iceland proposed Greenland (Amalie Jessen) as vice-Chair. Both accepted and were applauded by the meeting.

13.2 Press Release

The General Secretary presented the draft press release prepared by the drafting group (including Guri Male-Breigutu – Norway and Nette Levermann - Greenland) appointed on day 1 of the Council meeting. The participants were urged to comment and approve the draft so that Council could endorse the text. After the presentation and taking on board some comments, observer countries were encouraged to associate with any points that they considered relevant and wished to identify with.

The finalised approved press release is included in Appendix 8, and was placed on the NAMMCO website on the evening of 5 February 2015. The text was distributed to Council, meeting participants, range state governments, national and the international media, and international organisations.

13.3 Next meeting and closing of meeting

The next meeting will be hosted by the Secretariat in Norway at a venue yet to be determined. The date will likely be in the second week of February 2016. The Chair of Council thanked all delegates and participants for a productive meeting, and declared the meeting closed.

Appendix 1 Agenda

1. Opening Procedures
    - 1.1 Welcome Address
    - 1.2 Admission of Observers
    - 1.3 Opening Statements
    - 1.4 Adoption of Agenda
    - 1.5 Meeting Arrangements
    - 1.6 Invited Speaker – Henry Alexander Henrysson – Title: The Hunting of Marine Mammals: Conflict, Consensus and a Moral Code

2. Finance and Administration
    - 2.1 Report of the Finance and Administration Committee
    - 2.2 Audited Accounts 2014
    - 2.3 Budget 2015 and Draft Budget 2016
    - 2.4 Other Business

3. Scientific Committee
    - 3.1 Report of the Scientific Committee
    - 3.2 T-Nass 2015
    - 3.3 Priorities and Work Plan of the Scientific Committee in 2015-2016
    - 3.4 Other Business – Adoption of New Text for the Scientific Committee Rules of Procedure

4. National Progress Reports

5. Management Committee for Cetaceans
    - 5.1 Report of the Management Committee for Cetaceans
    - 5.2 Recommendations for Requests for Advice
    - 5.3 Other Business

6. Management Committee for Seals and Walruses
    - 6.1 Report of the Management Committee for Seals and Walrus
    - 6.2 Recommendations for Requests for Advice
    - 6.3 Any Other Business - Canada, Norway and Greenland to give an Update on The WTO-Case on Seal Products

7. Hunting Methods
    - 7.1 Report of the Committee on Hunting Methods
    - 7.2 Hunting Manuals
    - 7.3 Other Business

8. The Joint NAMMCO Control Scheme
    - 8.1 Report of the Committee on Inspection and Observation
    - 8.2 Observation in 2014
    - 8.3 Observation Planned in 2015
    - 8.4 Other Business

9. Environmental Questions

10. External Relations
    - 10.1 Cooperation with International Organisations
    - 10.2 ICES and Seal Working Groups
    - 10.3 Other Business

11. Information
    - 11.1 Scientific Publications

11.2 Progress on Stock Status List - Website
11.3 Upgrading of The NAMMCO Website

12. Any Other Business
    12.1 Marine Mammals and their Role in Food Security - Update

13. Closing Arrangements
    13.1 Elections
    13.2 Press Release
    13.3 Next Meeting

Appendix 2 List of documents

NAMMCO/23/1	List of Participants
NAMMCO/23/2	Agenda
NAMMCO/23/3	List of Documents
NAMMCO/23/4	Report of the Finance and Administration Committee
NAMMCO/23/4.1	Audited accounts 2014
NAMMCO/23/4.2	Budget 2015 and forecast budget 2016
NAMMCO/23/5	Report of the Scientific Committee
NAMMCO/23/6	T-NASS 2015 Proposal
NAMMCO/23/7	Report of the Management Committee for Cetaceans
NAMMCO/23/8	Report of the Management Committee for Seals and Walrus
NAMMCO/23/9	Report of the Committee on Hunting Methods
NAMMCO/23/10	Report of the Committee on Inspection and Observation
NAMMCO/23/11	External Relations
NAMMCO/23/12	Information
NAMMCO/23/13	Amendment to the Scientific Committee Rules of Procedure
NAMMCO/23/14	Manual on hunting of small whales in Greenland
NAMMCO/23/15	Inspection and observation in 2014 and planned in 2015
NAMMCO/23/INFO 1	Letter from ICES to NAMMCO regarding WGHARP
NAMMCO/23/NPR-F	National Progress Report Faroe Islands
NAMMCO/23/NPR-G	National Progress Report Greenland
NAMMCO/23/NPR-I	National Progress Report Iceland
NAMMCO/23/NPR-N	National Progress Report Norway
NAMMCO/23/NPR-C	National Progress Report Canada
NAMMCO/23/NPR-J	National Progress Report Japan - compilation
NAMMCO/23/NPR-R	National Progress Report Russian Federation

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Appendix 4 Opening statements

WELCOME ADDRESS BY THE CHAIR OF NAMMCO COUNCIL

Delegates, Observers and Guests

It gives me great pleasure to open the 23rd Annual Meeting of NAMMCO here in Reykjavik where the Ministry of Education and Culture resides. Iceland takes great pleasure in hosting this important event in the NAMMCO calendar.

I would like to express my gratitude to the Secretariat and my colleagues here in Reykjavik, for carrying out good work in preparing this meeting and providing us with excellent meeting facilities. This year brings about big changes in the Secretariat. Our present General Secretary, Christina Lockyer, who has been with us since March 2005 and for the past 10 years, is leaving us at the end of this month. This will be her last Council meeting. Already NAMMCO has announced the new General Secretary who is Geneviève Desportes, many of you may know Geneviève as she has been greatly involved in the Scientific Committee of NAMMCO. The work of the Secretariat will thus continue efficiently under the leadership of our new appointee.

The work done by the Hunting Committee in producing the new hunting manuals has been noted internationally and is now completed. In September 2014, the Secretariat presented this work at the IWC's workshop on whale killing, and demonstrated the quality and authority of NAMMCO in this field.

NAMMCO has followed through with the idea of promoting marine mammals in the arena of food security – an idea seeded at the Ministerial meeting in Svolvær, Norway, on the occasion of the 21st anniversary of the NAMMCO Council meeting. External funding has since then been awarded by NORDEN to help in this project, and at this meeting, we will learn more about the details of how this will unfold.

Finally, the planning of the Trans North Atlantic Sightings Survey in 2015 has been a huge exercise in cooperation between member nations to coordinate funding and finding methods to integrate information on the abundance of all shared whale stocks. Continuation of such surveys are of vital importance for the sustainable management of cetacean stocks in the NAMMCO area. Despite some financial setbacks during 2014, the scheduled surveys will go ahead and be completed by the end of 2016.

FAROE ISLANDS – OPENING STATEMENT

Madam Chair, Delegates, Observers, dear Friends

The Faroe Islands consider NAMMCO cooperation to be of great importance. I mentioned last year that NAMMCO must develop and grow in the future. I also mentioned the importance of the scientific work produced by NAMMCO. This is a platform we wish to build on.

The Faroe Islands are experiencing a series of attacks on our whaling practices – currently and probably in the forseeable future, too. International lobbyists bring critical questions into various parliament questions as well as to the European Parliament. These efforts are without exception ill- founded and lacking of coherent facts. The aim is clear: Primitive and blood-thirsty islanders must bring their murderous traditions to immediate stop!

It is an ongoing struggle to meet these attacks with constructive information that may explain the real nature of affairs. Our EU mission in Brussels makes tremendous efforts in this respect.

However, to quote a late, respected statesman: "They are many, and we are few!" Our efforts need to build on clear, scientific ground; there must be cooperation. Alone, there is so much we can do while with an organisation like NAMMCO in the background it is our sincere hope that we may continue to develop and coordinate efforts that will further our legitimate rights. Our right to sustainably harvest our surrounding oceans.

Sea Shepherd visited the Faroe Islands last year and the promise to return this year with increased force. This is a very tangible and real challenge. The Faroe Islands will, as a rule, welcome all visitors, even those who represent strong opinions on our whaling traditions. We respect different opinions as we expect others to respect ours. But we will not, however, permit unlawful behaviour. We will be sure to fill you in on the developments as they unfold.

We look forward to the coming TNASS 2015. Strengthening our scientific ground must always be paramount in our efforts to sustain our practices. It therefore essential that all member countries make the coordinated surveying efforts top priority in all our countries.

For a number of years NAMMCO has enjoyed the privilege of being headed by our General Secretary, Dr Lockyer. The Faroe Islands wish to thank Christina for her contribution to our organisation and all the good work she has been in charge of for so long.

Finally, we want to thank Iceland for hosting this annual meeting. We look forward to some good discussions and presentations here. As mentioned before, we look forward to the coming sightings survey, which will be very important to us. The survey will produce qualified estimates, which in turn will serve to support sustainable management of our stocks. We appreciate that knowledge is essential for ensuring future sustainable utilisation of our stocks.

GREENLAND – OPENING STATEMENT

Mrs Chair, Ladies and Gentlemen,

Sustainable and responsible management of sealing and whaling:

Greenland is proud of the substantial progress we have made to strengthen NAMMCO cooperation and acknowledging the importance of maintaining sustainability in the North Atlantic and the important leadership role of the best practice in regional management of marine mammals in taking concrete actions to respond to new opportunities and challenges.

For nearly 23 years Greenland has with other member countries reaffirmed the commitments outlined in the NAMMCO agreement to sustainable development, including economic and social development through improved management and research conditions on marine mammals. We have also debated socioeconomic and cultural well-being for the inhabitant's co-existence with marine mammals. We are engaged in the debate of food security to show that marine mammals are under-estimated protein source that could benefit the world population.

NAMMCO areas are inhabited regions with diverse economies, cultures and societies, but we have been able to work closely with each other to reach our main purpose in NAMMCO, which is sustainable use of all marine resources. NAMMCO does not categorize countries to certain group of people or categorize the hunts to aboriginal, small-type whaling or commercial whaling or sealing. The key word is sustainable use. NAMMCO also recognizes the differences each country leaves under. Unfortunately, some other countries and international unions and organizations are eager to pinpoint some of our differences in a negative manner. The marginalization of whaling and sealing to "do not touch" due to the stated "public moral" and perceptions based on feelings is an on-going challenge. The final conclusions from the WTO case on sealskin ban are one example where European societies try to split NAMMCO countries, not respecting the facts and realities. Yet, last word has not been said; we once again can expect actions from the European countries regarding our seal hunting.

We are aware of NAMMCO areas stand at the threshold of significant changes, with increased economic activity, changes to lifestyles and impacts on local inhabitants and changes to ecosystems. It is therefore important that NAMMCO countries overcome the challenges by facilitating for instance T-NASS through commitment, dialogue, cooperation and interaction within the Council and relevant Committees that benefit peoples in NAMMCO countries.

Greenland also welcome the recent success of finalization of stock status and hunting manuals and recommend

Council to consider whether best practices from these events could inform the broader work of the Council.

A stronger NAMMCO as a regional management organization requires stronger Scientific Committee and other Committees, which can benefit the future work for the Council. Greenland is therefore committed to find ways where we can enhance the capacity of NAMMCO as a regional management organization.

ICELAND – OPENING STATEMENT

Madam Chair, delegates, observers and dear friends.

On behalf of the Icelandic Government, I have the honour and pleasure to welcome you to Iceland to the twenty third meeting of the Council of NAMMCO.

First, I would like to extend special thanks to Christina Lockyer for her devotion and diligence in carrying out the duties of the General Secretary of NAMMCO over the last ten years. Iceland greatly appreciates her work and valuable contribution to NAMMCO. I would also like to express our gratitude to the Secretariat that has done a good work in preparing this meeting and providing us with excellent meeting facilities.

NAMMCO is of great importance for Iceland, as sustainable utilisation of marine resources is of fundamental significance for the economic survival of the Icelandic people. In fact we have no alternative but to give sustainable utilisation of marine resources such a high status, as one of the main pillars of Iceland's economy is our responsible, technical and scientifically based management of the marine resources.

Marine mammals are of course an integral part of Iceland's ocean policy as they form a large component of the marine ecosystem. With respect to conservation and management, marine mammals should be considered in the same way as all the other components of the ecosystem, with a long-term objective of sustainable management.

In recent years, Iceland has been exposed to increasing pressure to stop it's whaling activities, not only from anti-whaling NGO's but also from most of the EU member states. In addition, Iceland has been certified under the Pelly Amendment by the US secretary of the Interior as Iceland reported at last year's meeting. In general, this pressure has particularly pertained to the fin whaling where allegations have been made that fin whales in the North Atlantic are endangered and that Iceland's catch levels are unsustainable. These allegations are in strong contrast to the conclusions and recommendations by the Scientific Committee of NAMMCO, which have been approved by the NAMMCO Council. These scientific assessments and the resulting management advice provided by NAMMCO have formed the main basis for decisions on the Icelandic harvesting levels of fin and common minke whales.

Iceland appreciates very much and places a strong emphasis on the management advice given by the Scientific Committee of NAMMCO. At the same time, Iceland feels that this high quality scientific work could be highlighted more by NAMMCO, especially when discussions related to this work are prominent in the world press. In our opinion, NAMMCO's visibility and influence could be increased by more active participation in the various international fora and in the world press. By taking on a more proactive role, NAMMCO would render more support to its member countries in their continuous battle against wrongful accusations by powerful bodies in the world media.

The series of North Atlantic Sightings Surveys have been of paramount importance for NAMMCO as an organisation and its member countries. The continuation of this series in 2015 is of vital importance as the time since the last survey in 2007 is approaching the maximum acceptable for responsible management.

Iceland also welcomes the work undertaken by the Scientific Committee towards estimation of bycatch rates of marine mammals, particularly for the fisheries in Iceland and Norway. In this important field, there is clearly room for improved management.

Iceland welcomes the progress made in developing the NAMMCO website for Stock Status of marine mammals. In particular we would like to acknowledge the contribution of the newly appointed General

Secretary of NAMMCO Geneviève Desportes to this project. I would like to use this opportunity to congratulate and welcome her to this new position.

Finally, I am confident that this meeting, like past meetings, will be fruitful and constructive, built on an objective, and science-based approach.

NORWAY – OPENING STATEMENT

Madam Chair, Delegates, Observers and Guests - Dear friends

It is a pleasure to express our appreciation to the Government of Iceland for hosting the 23th Annual Meeting of NAMMCO and for providing us with such convenient facilities here in Reykjavik.

We are happy to see that NAMMCO, over the last years, has strengthened its position as a well-functioning management body that generates high quality advice to its members, observers and other interested parties.

Through NAMMCO we have created an instrument and an environment for researchers and managers that enable us to fulfill our need to cooperate and thereby meet our international obligations under the Law of the Sea.

Nevertheless we must ask ourselves if the scope and quality of our organization meet our future needs, and enable us to strengthen both the understanding and acceptance of our way of life in the international community.

NAMMCO's work on animal welfare and hunting methods is a prime example of high quality advice that hands-on management needs. I would like, once again, to commend the Committee on hunting methods. The relevance and quality of its work are reflected in the fact that all whaling nations now use NAMMCO for guidance in this field.

It is Norway's goal to secure and further develop our organization in this respect. We need to be at the forefront of what constitutes relevant and reliable knowledge.

Progress reports have also this year been submitted by Canada, Japan and Russia. This is a sign of strengthening cooperation between our countries that Norway very much welcomes. And we would like to repeat our wish for a closer cooperation between these countries and NAMMCO.

I look forward to and wish us all a fruitful meeting.

CANADA – OPENING STATEMENT

Madame Chair, distinguished delegates, fellow observers and guests:

Canada is pleased to participate as an Observer in this 23nd meeting of the NAMMCO Council. I would like to take this opportunity to thank our Icelandic colleagues for hosting this meeting.

NAMMCO continues to be an organization that is well-known for providing strong and impartial science advice on marine mammals and has shown a dedication to the sustainable management of marine mammals and I look forward to productive discussions over the next three days.

JAPAN – OPENING STATEMENT

The delegation of Japan would like to thank the Government of Iceland for its hospitality and the NAMMCO Secretariat for the meeting arrangements. It is our view that cooperation between NAMMCO and Japan is vital for achieving the sustainable use of marine living resources including cetaceans. Japan recognizes various achievements of NAMMCO as an organization for international cooperation related to the sustainable use of marine living resources based on science, in conformity with international law and with respect for the needs of coastal communities and indigenous people. Japan therefore highly appreciates the invitation to attend this

important meeting.

As you know, on 31 March 2014 the International Court of Justice (ICJ) delivered its Judgment in the case concerning "Whaling in the Antarctic" (Australia v. Japan: New Zealand intervening). In the Judgment, the ICJ found that the second phase of Japan's whale research program in the Antarctic (JARPA II) did not fall within the provisions of Article VIII, paragraph 1, of the International Convention for the Regulation of Whaling (ICRW) and that therefore Japan did not act in conformity with its obligations under paragraphs 7(b), 10(e), and 10(d) of the Schedule to the ICRW. The ICJ decided that Japan shall refrain from granting any further permits in pursuance of the JARPA II.

Japan was disappointed with the Judgment but has faithfully observed it. However, there were a number of positive aspects in the Judgment including the firm confirmation that "sustainable exploitation of the whale resources" remains as one of the objectives of the ICRW and "[a]mendments to the Schedule and recommendations by the IWC may put an emphasis on one or the other objective pursued by the Convention, but cannot alter its object and purpose" (paragraph 56). The ICJ also noted that "Article VIII expressly contemplates the use of lethal methods", and that resolutions and guidelines adopted by the Commission "do not establish a requirement that lethal methods be used only when other methods are not available" (paragraph 83). The ICJ further found "that the use of lethal sampling per se is not unreasonable in relation to the research objectives of JARPA II" (paragraph 224) and that a special permit program involving the sales of whale meat, taken alone, is not outside the scope of Article VIII (paragraph 94).

Subsequent to the Judgment, on 18 April, 2014, Japan's then Minister of Agriculture, Forestry, and Fisheries, Mr. Yoshimasa Hayashi issued the following policy statement concerning the future whale research programs.

> *"The ICJ judgment reaffirms that one of the purposes of the International Convention for the Regulation of Whaling (ICRW) is the sustainable exploitation of whale resources. In light of this, Japan has confirmed its basic policy of pursuing the resumption of commercial whaling, by conducting research whaling,…"*

The statement also informed that Japan had decided to cancel JARPA II and reduce the scale of its research program in the Northwestern Pacific in 2014 and that Japan would further an earnest review of a whale research program in the Antarctic with the aim of submitting a new research program to the IWC Scientific Committee by autumn 2014.

I would also like you to note that Prime Minister Shinzo Abe has stated at the Diet that Japan would continue to explore the resumption of commercial whaling, while conducting research whaling based upon international law and scientific evidence in order to gather scientific data that is essential for the management of whale resources.

Accordingly, on 18 November 2014 the Government of Japan submitted the proposed plan for a new research program in the Antarctic Ocean, namely the New Scientific Research Program in the Antarctic Ocean (NEWREP-A) to the Chairman of the IWC Scientific Committee and the IWC Secretariat. The proposed research plan was circulated to all IWC members and is available at the web site of the Fisheries Agency of Japan (http://www.jfa.maff.go.jp/j/whale/pdf/newrep--a.pdf).

The submission of the proposed research plan which has fully taken account of the reasoning and conclusions of the ICJ Judgment, has initiated the IWC process to review the plan in line with Annex P; Process for the Review of Special Permit Proposals and Research Results from Existing and Completed Permits. A small specialist workshop which will take place this month in Tokyo will review and comment on the plan and produce its report for consideration by the Scientific Committee to be held in May 2015.

At the 22nd Meeting of the Council in February 2014, Japan expressed its heartfelt sympathy to the people of Greenland following the denial of its proposed aboriginal whaling quotas. Japan is pleased that this matter was resolved at the 65th meeting of the IWC, but it is regretable that Japan's proposal on small-type coastal whaling has not yet been adopted by the IWC. Furthermore Japan would like to express our deep concern about two resolutions adopted at the 65th meeting of the IWC: Resolution 2014-5 intended to increase the involvement of the Commission in respecct of special permit research programs and Resolution 2014-4 which

is intended to redirect the work of the Scientific Committee towards "conservation related matters". Regretably, these resolutions will only increase the level of conflict within the IWC.

Finally, as in the past, our delegation wishes to inform you of Japan's intention to make its best efforts to reaffirm the unity among countries supporting the sustainable use of marine living resources and to mobilize their efforts to cope with the next meeting of the IWC in 2016. Japan's efforts will include organizing a meeting in Tokyo in autumn 2015 on the Sustainable Use of Marine Living Resources including Cetaceans. Japan looks forward to your cooperation in our efforts.

RUSSIAN FEDERATION – OPENING STATEMENT

Dear NAMMCO Chairman and Vice-Chairman, Members of NAMMCO Secretariat, delegates, colleagues, observers, ladies and gentlemen,

It is a great honor for me and my colleague Olga Zyatneva from Russian Fisheries Agency to represent the Russian Delegation at 23rd Meeting of the NAMMCO Council.

On behalf of the Russian Delegation, I would like to thank the NAMMCO Secretariat and Icelandic authorities for hosting this annual meeting in the Reykjavik nice port city and for the excellent arrangements, and also for the preparations for this meeting.

We would like to commend the excellent work undertaken by different NAMMCO bodies and in the first NAMMCO Secretariat and Scientific Committee including different working groups during the inter-sessional time. Also we would like note that NAMMCO has very good cooperation with different countries, and not only observer countries, marine mammals companies and different North Atlantic organizations and Commissions; in the first it is NAFO, NEAFC, and also with ICES and IWC.

It is very important that the NAMMCO position on marine mammals has for many years been based on a strong ecosystem approach only and hence from it all marine mammals stocks can be stabley exploited on the basis of scientific results and surveys and also from precautionary principles only. For this reason, here a very important place belongs to the results of the International Trans North Atlantic Sighting Surveys (so-named T-NASS).

We would like tell you once more that the Russian Federation is very interested in long term cooperation with NAMMCO, and we hope that this cooperation will develop.

We have a full agenda ahead of us during this week. We are looking forward to a successful and productive work during this Meeting.

Thank you very much for your attention!

Appendix 5 Summary of invited talk

The Hunting of Marine Mammals - Conflict, Consensus and a Moral Code

Henry Alexander Henrysson,
Centre for Ethics, University of Iceland, 101 Reykjavik, Iceland

In recent years, we have witnessed sporadic outbursts of conflicts in the public dialogue on the hunting of marine mammals. Although this conflict has not been particularly robust in the Nordic countries recently, it seems as if a stout polarisation between the two main views of hunting and preserving these mammals has become even more evident than before. On the one hand we have seen the rise of a mostly urban dialogue asking for a total ban on the hunting and utilisation of marine mammals while, on the other hand, the more traditional view of hunting has kept its share of following in the more remote areas. The rhetoric of both sides can be staggeringly difficult to comprehend at times which has made it quite hard to solve this moral dilemma of whether this hunting can be morally permissible. Leaving aside some well-known theories on environmental ethics, this talk focuses on the arguments of both sides in order to assess whether an ethical consensus can be reached and what it would entail. In particular, this talk suggests that we should seek ways to meet our primary moral obligation of making an effort to understand both sides – or as many sides as possible – when trying to seek a way forward out of a moral dilemma.

In this talk, I discuss what I take to be the five main attitudes of the participants in the public dialogue whether the hunting of marine mammals is morally justified or not. I then move on to introduce what appears to me as being the seven main types of arguments for these different attitudes or positions. Finally, I see if applying a set of seven questions which I see as necessary for a critical analysis of each type of argument. This talk argues that most of the arguments expressed in the public discourse regarding the hunting of marine mammals are both fallacious and factually limited. However, it also stresses that this should not come as a surprise; the public discourse on any contested matter has gaps and holes in it, even when one leaves out the downright idiotic arguments. In fact, all the arguments mentioned in this talk are in many respects soundly portrayed and based on good moral intuitions; they are not 'wrong' or 'incorrect'. Thus, the role of the critical analysis is not to *debunk* arguments; neither is its role to provide the answer to a pressing dilemma. What applying this analysis – a dose of critical thinking – can teach us is how we can move forward instead of feeling as if we should always 'stick to our guns'. The fact is that there is no 'killer argument' available when it comes to making a choice between the alternatives in such a complicated problem. This talk urges stakeholders to realise that there are good reasons both for and against hunting. Neither side can associate itself with the 'voice of reason'.

This talk ends with a discussion on a notion that pervades any theoretical discussion of bioethics. This is the notion of 'trust'. Surely, we can, and should, clarify and tune our discourse on the question whether the hunting of marine mammals is ever morally justified. We will, however, most probably never all agree on a position. The public perception is always going to be in conflict. As soon as we realise this, the next step should be to ask ourselves how we can proceed from here and, indeed, establish *trust* between the stakeholders. The answer is not simply to concede some of our demands and meet in the middle. In this talk I argue that in the case of hunting, the one doing the act – the hunter – needs the trustworthiness more than the counterpart. Insisting on the right to hunt comes with an obligation – one is obligated to do it *properly*. And what is 'proper' is best established by a written code of conduct which ensures for example effective monitoring and enforcement of specific rules. Polarisation is, after all, nothing but a lack of effort meeting this obligation of making an effort to understand each other. The hunting of marine mammals in the Nordic region may gain a moral and an identifiable status if a consensus is sought between various stakeholders. This consensus would be based on a mutual understanding whatever the basic differences in attitudes towards hunting of marine mammals.

Appendix 6 Audited accounts for 2014

Accounts 2014

Income	**Accounts 2014**
Contributions Faroes	526,025
Contributions Greenland	526,025
Contributions Iceland	1,052,059
Contributions Norway	2,104,102
Interest received	45,883
Sale of publications	0
Employers tax covered by Norway	270,570
Employees' tax	876,208
Total income	**5,400,872**
Expenditure	
Staff related costs	3,773,430
Staff travel and subsistence	247,484
Meetings	149,377
Office rent	213,488
Communications & office supply	114,307
Information and printing	185,569
Accounts and auditing	105,239
Observation Scheme	94,664
Scientific Committee	52,702
TNASS2015	105,844
Other expenses	16,008
Hunting Committee	5,402
Project Marine Mammals as food	
Total expenditure	**5,063,514**
Yearly Balance	337,358
Previous year liquidity (surplus/loss)	0
Transfer to general reserve	-100,000
Transfer from general reserve	
Present year liquidity (surplus/loss)	237,358
General Reserve	367,908

Appendix 7 Statement from KNAPK

Dear Friends

Thank you for giving me the opportunity to talk today.

As you know, seal hunting is of great importance for Greenland and for the livelihood of many people living in coastal areas around the Arctic. Coastal people's right to hunt and exploit marine mammals and utilize the fish stocks has always been a firmly established principle in the Organization of Fishermen and Hunters in Greenland, KNAPK.

Over the years, the campaigns from animal rights organizations have injured sealing industry in Greenland and other countries. The European import ban on sealskin is no exception. The sad truth is that our ancient profession is on the verge of collapsing.

For too long have the people of the international community not wanted to listen to us. We have hoped things would change. We have hoped our hunters could once again earn a decent living from hunting a small part of the abundance of seals in our waters. In KNAPK we have come to the realization that we need to make our voice heard.

That is why we, in cooperation with Master Vision in Copenhagen, formed the campaign INUIT SILA with the purpose of informing first the Danish people then the rest of Europe, about the sustainable seal hunting in the North Atlantic. This could not have been done without the support we receive from the people in Greenland and from our politicians, who are united in this course. We are grateful for the impressive support from the Government of Greenland as well as from market players like Kopenhagen Fur, Great Greenland and International Fur Federation. Most of all, we appreciate that all have united behind the strategy that this is a battle of perception, to reverse the anti sealing campaigns and annul the EU legislation. First we need to change the perception of the average consumer in Europe and elsewhere.

Until now, this work in INUIT SILA, has led to a massive change in the understanding of seal hunting in Denmark. All political parties have united in this, and from the fur retailers we hear that they see the perception has changed and consumers no longer question the ethics of sealskin.

In KNAPK we see this as the first steps of a long journey. A journey that will lead us to re-establishing the seal as a legitimate prey animal and as an attractive product. Hopefully along the way, we will also succeed in educating the people we meet, people who themselves live far from nature, about our way-of-life and our dependency on all nature’s resources.

Our aim is to unite all Inuit seal hunters in this battle, from Greenland, Canada, Alaska and Russia. I am proud to say that we have taken the next steps already. Together with INUIT SILA Copenhagen, I visited Nunavut in January this year, to ask our fellow Inuit seal hunters to join us in this battle. I am deeply touched by the warm welcome we received, from the federal government offices in Ottawa to the Inuit organizations in Nunavut to the local hunters in Iqaluit. I must say I came home with new energy and the firm believe that united we can change this.

The coming actions will be to take the campaign across Europe. We know this is not overcome in a day, but we will slowly, country-by-country, use the strategy and learnings we already have, to spread the understanding and acceptance to important European countries.
Later this year, together with our fellow seal hunters from Nunavut, we will travel to the countries around the Baltic Sea, where local fishermen are also suffering from an unregulated population of seals eating their fish. We will meet with politicians and journalists and tell them that the ban is jeopardising the lives of a whole people living in the Arctic and North Atlantic.

But, I must also be honest with you, and say that all is not easy. As I see it, there are two things that are crucial at this point.

- We need to secure funding to build a strong campaign organization that can counter the immense propaganda by animal rights organizations.
- We need a strong voice with clear demands from the Greenlandic and Danish governments.

From KNAPK and INUIT SILA we have suggested that the following demands are put to the EU:

1) Annulment of the discriminatory EU ban, that has coursed Greenland to loose up to 90% of it's export of sealskin, worth almost 50 million Euro since 2006.

2) An extensive information campaign financed by the EU, with the goal of restoring consumer confidence in Inuit sealskin and thus restoring our exports.

3) Compensation for the damage caused. We suggest this is done by investing in new business and income opportunities in the hunting industry and by that creating a future for the hunters who have suffered the most from this.

With this, I would like to thank you for giving me the opportunity to inform you on our work with INUIT SILA. I hope you also see this as a battle for all people who are dependent on the resources given to us by nature. We all know that the seal is perceived as an almost holy animal, and that this idea has led to these anti-sealing campaigns and bans. We know this happened regardless of facts and knowledge, purely on the basis of perception and moral. But what we don't know is which natural resources are next. What will the city-dwellers in Europe ban next, if we don't make them understand our way-of-life?

Thank you for your time.

Leif Fontaine
Vice president of KNAPK
Founder and spokesperson of INUIT SILA

Appendix 8 Press release

NAMMCO - the North Atlantic Marine Mammal Commission - is an international body for cooperation on the conservation, management and study of marine mammals in the North Atlantic. The North Atlantic Marine Mammal Commission held its 23rd Council meeting from 3 – 5 February 2015, in Reykjavik, Iceland. The member countries of NAMMCO, the Faroe Islands, Greenland, Iceland and Norway again confirmed their commitment to ensuring the sustainable utilisation of marine mammals through active regional cooperation and science-based management decisions.

The Governments of Canada, Denmark, Japan and the Russian Federation were represented by observers at the meeting, as well as other international governmental organizations within the fields of fisheries (Northeast Atlantic Fisheries Organization (NAFO), North East Atlantic Fisheries Commission (NEAFC), and South East Atlantic Fisheries Commission (SEAFO)) and whaling (International Whaling Commission (IWC)).

Key events and conclusions from the meeting included the following:

- **Ethics of Hunting Marine Mammals**

Professor Henry Alexander Henrysson of the Centre for Ethics at the University of Iceland gave a scholarly and thought-provoking presentation *The Hunting of Marine Mammals: Conflict, Consensus and a Moral Code* during the opening session of the meeting. The talk explored and exposed the popular opinions and taboos with respect to hunting in general but specifically concerning marine mammals. This catalysed many questions, and provided an excellent introduction to NAMMCO's interest in promoting marine mammals as a food resource.

- **Marine Mammals and Food Security**

Following a ministerial meeting in 2012, NAMMCO decided to examine the use of marine mammal products in the context of global food security. A Planning Group established at NAMMCO 22 has now outlined two main goals 1) production of a background document reviewing and compiling existing material on the topic, and 2) ways to communicate the message.

- **Manuals on Whale Hunting**

NAMMCO has now completed all three authoritative manuals: one dealing with large baleen whaling and the use of whaling cannon and the penthrite grenade, a second dealing specifically with the use of the spinal lance and hook in the pilot whale hunt, and just recently, the third and last one that is dealing with hunting of small cetaceans in Greenland. These provide details on use, maintenance, weaponry and ballistics information with a focus on safety for hunters and improved animal welfare. All are available online at www.nammco.no in English language. The manuals are also available in native languages as required for the hunting communities.

- **NAMMCO Scientific Publications – free online**

The journal website (http://septentrio.uit.no/index.php/NAMMCOSP/index), as of 30 January 2015, has had almost 4,000 visitors from 97 countries since its launch in August 2013. The *Walrus of the North Atlantic* volume 9 has now been published both online and in hard copy. The volume 10 on *Age estimation of marine mammals with a focus on monodontids* has 8 papers published online as "online early versions". All previous volumes 1-8 incl. are now accessible on the journal website.

- **Inspection and Observation**

NAMMCO operates an international observation scheme to monitor whether national legislation and decisions made by the Commission are respected. Observers are appointed to report on hunting activities in member countries. The scope for 2015 is whaling in the Faroe Islands.

- **Whale Surveys**

The series of North Atlantic Sightings Surveys (NASS) has been the flagship of NAMMCO and is of vital importance for the sustainable management of cetacean stocks in the NAMMCO area. Member nations are planning the sixth North Atlantic cetacean Sightings Survey (NASS). NASS will be coordinated with other national surveys in the area in the summer of 2015, and the area to be covered extends 1,740,000 square nautical miles including areas around West, Northeast and East Greenland, Jan Mayen Central Atlantic, north and south of Iceland and areas along and to the west of Norway encompassing the area around the Faroe

Islands.

- **International Cooperation**

Cooperation between NAMMCO and ICES (International Council for Exploration of the Sea) regarding the scientific seal working group, WGHARP which is the successor to the former ICES/NAFO WG on harp and hooded seals, is in the process of formalisation. This new link with ICES and NAFO is recognition of NAMMCO's important role in seal scientific and management advice.

- **Climate Change – Effects on Ice-breeding Seals**

Of concern to NAMMCO, is the ice retreat with subsequent habitat loss which is a challenge for all ice breeding seals, harp seals included. Harp seals require stable ice for pupping, nursing and the first weeks after weaning when the young develop the capacity to swim and feed. It has been observed that they may respond to poor ice conditions in different ways, depending on the presence or absence of ice at the beginning of the pupping period. If no ice was present, females moved away from their traditional whelping areas to find suitable ice. If small amounts of ice were present, females gave birth even if the ice was too thin to sustain the pups, resulting in high pup mortality. If the predicted warming trends continue, ice-breeding harp seals will encounter more years with poor ice conditions and may eventually adapt by moving to alternative areas. Until then, they will continue to have increased levels of mortality.

- **Scientific Advice**

Scientific advice forms the basis of management advice in NAMMCO, and through the Scientific Committee, many specialist topics are addressed through Working groups. During 2015, topics to be addressed include stock assessments of walrus, narwhal and beluga, fin, common minke and humpback whales, and a special symposium on disturbance to marine mammals in their environment. In addition an expert working group on assessment of large whale killing methods.

- **New General Secretary**

The meeting acknowledged the 10 years of service by the present General Secretary, Dr Christina Lockyer, who will resign 1 March 2015, and thanked her for her good work and long service. It was announced that the new General Secretary, Dr Geneviève Desportes, who has had a long affiliation with NAMMCO through her work in the Scientific Committee, would be commencing her appointment in April 2015.

Regarding Council, the present Chair, Ms Ásta Einarsdóttir (Iceland) was re-elected for a further term of office, as was the vice-Chair, Ms Amalie Jessen (Greenland).

1.2 REPORT OF THE COMMITTEE ON HUNTING METHODS

The Committee on Hunting Methods met on 19 and 20 November 2014 at the Greenlandic representation in Copenhagen. Present were Eyþór Björnsson, Chair and Guðni Magnus Eriksson (Iceland), Egil Ole Øen, Kathrine Ryeng and Hild Ynnesdal (Norway), Jústines Olsen, (Faroe Islands), Nette Levermann (Greenland), and Christina Lockyer and Charlotte Winsnes from the Secretariat.

1. INTRODUCTORY REMARKS, ADOPTION OF AGENDA AND APPOINTMENT OF RAPPORTEUR

The Chair of the Committee, Eyþór Björnsson, welcomed the Committee members to the meeting. Björnsson could only participate on 19 November and the vice-chair, Nette Levermann, chaired the meeting on 20 November. The draft agenda was adopted and Charlotte Winsnes acted as rapporteur.

2. UPDATES ON HUNTING METHODS IN MEMBER COUNTRIES

The lists of references on hunting methods (NAMMCO/HM-November 2014-2), and laws and regulations in member countries (NAMMCO/HM-November 2014-3) were updated (see Appendices 1 and 2 of this report).

Faroe Islands

Olsen (Faroe Islands) informed the meeting that as of November only two minor drives of pilot whales had taken place in 2014. In addition, a few bottlenose and sperm whales had stranded.

The whaling season attracted unusually high attention from anti-whaling activists. On three specific occasions, activists had interfered with the whaling activities, resulting in people being fined and deported out of the country. One specific incident, scheduled to go to court in March 2015, resulted in Sea Shepard being accused of violating both the whaling regulations and the animal welfare law.

The drawing of the blade of the spinal lance described in the Executive Order on pilot whale hunting from 2013 has been revised with respect to the dimensions of the blade. Olsen also informed the meeting that 200 new blades are being produced in Japan and these will be distributed to all designated whaling bays in the beginning of 2015. Training of hunters based on the NAMMCO manual on pilot whale hunting will take place from January to March 2015. From 1 May 2015 it will be a requirement to use the spinal lance, and the old whaling knife is only allowed to be used after the whale is killed in order to bleed the animal.

The Committee took note of the information presented by the Faroe Islands. It noted that there seemed to be no plans for collecting TTD data and this was unfortunate. The Committee once again emphasized the importance of following the recommendations from the expert group on killing of small cetaceans (NAMMCO 2011) on how to measure TTD if and when this is undertaken. The Committee also commended Justines Olsen for his work with the manual on pilot whaling,

Greenland

Levermann (Greenland) informed the meeting that there is a revision to the Executive Order regulating the hunt on large whales (2013) pertaining to the hunting period for minke whales. The new hunting period is March to November. The change in period is reflecting an alteration in observed behavior of the minke whales.

Greenland set national quotas for large whales in 2013-2014 based on the advice from the IWC Scientific Committee.

The 2014 quotas for West Greenland are: 178 minke whales, 19 fin whales, 10 humpback whales, 2 bowhead whales and East Greenland: 12 minke whales.

There were 40 approved whaling boats with harpoon guns and 425 smaller boats were active in whaling activities in Greenland in 2013.

Whale catches in 2013 were:

- 9 fin whales

- 166 minke whales including 9 struck and lost in West Greenland and 4 in East Greenland with 2 struck and lost.
- 7 humpback including 1 struck and lost.
- 268 beluga in West Greenland (quota 330) and 26 in Qaanaaq (quota 20; technical, 5 year quota is given for 100 animals).
- 122 narwhals in West Greenland (quota 144), 83 in Inglefield Breeding (85; technical, 5 year quota of 485 animals), 70 in Melvin Bay (quota 81) and 65 in East Greenland (quota 88).
- 47 walrus in West Greenland (quota 60), 65 in Northwater (quota 62) and 8 in East Greenland (quota 18).

The catch numbers for beluga narwhal and walrus includes stuck and lost without specifying the actual numbers of S/L.

There are no quota regulations on other small cetaceans or pinnipeds in Greenland.

By catches:

- 1 minke whale, male, 7.8 meter, wounded/sick was permitted euthanized in Aasiaat. Not included in catch data above, October 2013.
- 1 bowhead whale near Aasiaat (no length given) observed entangled in fishing gear for crabs, June 2013. Not found again.
- 1 humpback whale female near Qeqertarsuaq, 10.64 meter, entangled in fishing gear for crabs was permitted euthanized, June 2013.

The hunting period for 2013-2014 was for fin whale and humpback whale from 1 January to 31 December and for minke whale and bowhead whale 1 April to 31 December.

Five single observations of a sperm whale stranding were made in 2013 of which two were in open water.

In 2013, there were 6 reported infractions of national legislation on large whales. The infractions were related to the use of minke whale grenade for fin/humpback whale and cold harpoon used for minke whale as secondary weapon. Also reported, as infraction was the sale of whale products without prior stamping of sale license and hunting without proper license.

NAMMCO had an observer in Greenland in 2014 on the West Coast.

The Committee was informed that Greenland had submitted a document to the IWC this year displaying all IWC resolutions of concern for and referred to by Greenland in their dealings with the IWC.

The Committee acknowledged that there are an inherent dilemma both for hunters and authorities with respect to regulations and animal welfare concerns related to the hunting and killing of large whales like fin and humpback whales. There have been incidents were the hunter has used a rifle or a minke whale grenade as a last resort (as secondary weapon) to kill the animal. Furthermore, the take of fin and humpback whales are so small in numbers that the hunters consequently are unable to accumulate a lot of experience and practice.

The Committee took note of the information presented by Greenland.

Iceland

Eriksson (Iceland) reported that there had been no new regulations on hunting of fin and minke whales the last year.

Minke whaling

The quota was 229 animals. There were two boats operative but these did not operate at the same time. Hunting period was from 30 April to 14 October. Due to bad weather and technical problems with the boats only 24 minke whales were caught.

Fin whaling

The quota was 154 animals of which 137 animals were caught including three struck and lost. There were two boats operative. Hunting period was from 16 June to 30 September. No infringements were reported.

Iceland collected TTD data in the 2014 season including post-mortem examinations. Due to bad weather and technical problems with the hunting vessels, it was only possible to get enough data on the fin whale hunt. Iceland hope to collect TTD data on minke whales in 2015. The data were collected after the Norwegian standard and are now being processed and analyzed in Norway. The plan is to present the data to NAMMCO in 2015 – see agenda item 4 below.

National inspections were conducted on a random basis for both hunts.

In Iceland the whalers have to pay for the license to hunt, in order to cover the price of inspection. To give better predictability and also encourage whaling the license period was increased from one to five years.

The Committee took note of the information presented by Iceland.

Norway
Ynnesdal (Norway) reported that there had been no new regulations with respect to hunting of whales or seals in 2014. The TTD data collected in 2011 and 2012 are in the final stage of analyses and will be presented to NAMMCO in 2015 – see agenda item 4 below.

Whaling
2014 had been the best whaling season for years. 736 minke whales were caught including five stuck and lost of a quota of 1286. 23 licenses were given for the 2014 season of which 21 vessels participated which is an increase of 3 boats from 2013. The hunting period was from 1/4-25/9, no infringements reported.

Last year the Committee was informed about a planned seminar on safety and maintenance of harpoon canons organised by the Minke Whalers Association and Vessel owners. This seminar never took place due to lack of finances.

Sealing
2014 had also been the best sealing season for years. Three vessels were active in the West Ice, mainly in Greenlandic waters 7116 adult animals were caught of a quota of 21.270 adult animals. The hunting season was from 10 April to 30 June but all vessels were back before 17 May. No infringements were reported and all vessels had national inspectors on board. The national inspectors oversee and control that the hunting methods are in accordance with regulations and they also control the quality of the meat.

In Norway the authorities encourage the whalers to increase the hunt and thus there are no fixed dates for the end of the hunting season. The marketing of the meat is the responsibility of the hunters and the marked – not the authorities. Last year "Merkevareforeningen" was established with the aim of increasing the home marked for whale meat. The idea is to critically review and establish standards for all steps in the process on how the meat is handled after the kill and until it is in the shops, and defining quality standards for the different parts of the whale meat. Most hunters have joined the Merkevareforening.

The seal hunt differs in that it is 80 % subsidised by the authorities. The big question in Norway now is whether this will be the case in the years to come.

The Committee took note of the information presented by Norway.

3. HANDBOOK/USER MANUAL

Presented under this agenda item were documents:

- NAMMCO/HM-November 2014-4 draft of the manual on small whale hunting in Greenland.

The presented document was drafted based on the last telephone meeting held 14 May 2014.

The Committee discussed the document thoroughly, going through the manual page by page editing text and deciding on illustrations, and the final structure of the manual.

Levermann and the Secretariat were tasked with finalising the manual in accordance with decisions made by the Committee.

The Committee commended Nette Levermann for her dedicated work on this manual.

4. EXPERT GROUP MEETING FOR PRESENTATION OF TTD DATA

Norway and Iceland have collected TTD data and these will be ready for evaluation in 2015. Norway collected data from the minke whale hunt in the seasons 2011 and 2012. Iceland intended to collect data from both the minke and fin whale hunts. Due to weather conditions and technical problems with the hunting vessels, collection of TTD from the minke whale hunt was not possible. TTD from the fin whale hunt was collected and are being processed and analysed in 2014 and can be presented to NAMMCO in 2015.

The Committee discussed various frameworks for a possible evaluation of the TTD data. It was agreed to recommend to Council that NAMMCO organise an expert group meeting in line with the one held in 2010 to review and assess large whale killing methods. Also hunting nations like USA, Canada, Japan and Russia will be invited to inform about their hunting practises and present data from their large whale's hunt. The following terms of reference was agreed upon:

The expert group meeting shall undertake a review and evaluate the whale killing data submitted to NAMMCO by member countries and associated hunting nations, as well as data and information on recent and ongoing research on improvements and technical innovations in hunting methods and gears used for the hunting of large whales.

Anticipated duration of the meeting is two days and suggested venue is either in Copenhagen or in Reykjavik, in November 2015.

The Committee also identified a preliminary list (not exclusive) of six possible experts from NAMMCO and non-member countries to be invited.

Awaiting the deliberations of Council the Committee closed this agenda item.

5. NAMMCO 22 FOLLOW UP

NAMMCO 22 tasked the Committee to organise a seminar on data collection, processing, analysis and presentation of TTD data. The request forwarded in recognition of recommendations arising from several expert group meetings on killing of large and small cetaceans. The method of collection and reporting of TTD should be similar for all member countries in order to facilitate comparisons between similar hunts and also between years to detect possible improvements in TTD. The method used for sampling, processing and analysis of TTD data from the minke whale hunt in Norway the last 30 years was recommended as the standard where possible.

The Committee agreed to organise a very practical, hands on seminar where the participants would be able to process actual data as an exercise. Some introductory lectures like how and what data to collect, how the collected data is processed/qualified so that it can be fed into statistical programs, description of the statistical methods etc. will be proceeded by a practical session. In the practical session participants are expected to work with particular data sets and to analyse and present the results in a standardised manner. Output could be a 1-2 page technical description on how to analyze the raw data.

Tentatively a two-day educational seminar is planned with participation from member countries but with the possibility for associated countries to take part if desirable. The idea is to hold this back to back with the expert group meeting described in agenda item 4 above.

The Secretariat was asked to seek the advice of Lars Walløe with respect to how the transfer of knowledge regarding statistical methods and presentation could best be done in such a seminar.

6. ELECTION OF OFFICERS

Nette Levermann (Greenland) was elected as chair for the period 2015- 2017. Guðni Magnus Eriksson (Iceland) was elected as vice-chair for the period 2015 -2017. The Committee thanked the outgoing chair, Eyþór Björnsson (Iceland) for his efficient and professional leadership.

7. NEXT MEETING

The next ordinary meeting in the Committee will be Friday 6 February 2015, back to back with the Annual meeting in Reykjavik, Iceland.

8. ANY OTHER BUSINESS

Greenland raised the issue of reviving the workshop on handling, processing and utilisation of hunted marine mammals that had been on the agenda in 2009. It was suggested that a new angle could be to look at the issue in the frame of the ongoing initiative marine mammals and food security.

The Committee agreed to revisit the issue at the next meeting, after having conferred with their homeland. The Committee asked the Chair and Secretariat to come up with a proposal for a program.

Olsen informed that representatives of Taijii had approached the Faroe Islands on its killing method with the lance. Olsen had also been invited to attend a meeting organized by students from outside Taijii that will take place in Taijii in the end of November. However as no hunters from Tajiin would be present at the meeting, Olsen had declined to participate.

During IWC 65 informal discussion were held between NAMMCO and representatives from the Japanese Agency of Fisheries and the mayor of Taijii related to a possible workshop on hunting and killing methods in the whale hunt in Taijii. No conclusions were reached but the NAMMCO Secretariat agreed to provide a tentative programme and budget for such a workshop prior to NAMMCO 23.

9. APPROVAL OF THE REPORT

The report was approved by correspondence on 23 December 2014.

Appendix 1 List of laws and regulations for marine mammal hunting

(Updated December 2014)

FAROE ISLANDS

Parliamentary Act	No 57 of 5 June 1984 on whale hunting No 54 of 20 May 1996 amending Parliamentary Act on whale hunting No 9 of 14 March 1985 on the protection of animals, as last amended by Parliamentary Act No 60 of 30 May 1990 No 43 of 22 May 1969 on weapons etc. as amended by Parliamentary Act No 54 of 12 May 1980 No 128 of 25 October 1988 on hare hunting
Executive order	No 57 of 12 September 1969 on weapons etc. No 19 of 1 March 1996 on exemption from protection of whales No 126 of 23 June 1997 on protection of whales No 87 of 20 September 2007 on protections of whales No 100 of 5 July 2013 on pilot whaling.

GREENLAND

Greenland Home Rule Act	No 12 of 29 October 1999 on hunting No 11 of 12 November 2001 on revisions to Greenland Home Rule Act No 12 of 29 October 1999 on hunting No 9 of 15 April 2003 on revisions to Greenland Home Rule Act No 12 of 29 October 1999 on hunting No 1 of 16 Mai 2008 on revisions to Greenland Home Rule Act No 12 of 29 October 1999 on hunting No 25 of 18 December 2003 on animal welfare No 29 of 18 December 2003 on nature protection
Executive Order	No 26 of 24 October 1997 on extraordinary check and approval of harpoon canons No 22 of 19 August 2002 on trophy-hunting and fishing No 18 of 9 October 2012 on hunting licenses for full time hunters No 17 of 9 October 2012 on hunting licenses for part-time hunters No 7 of 29 March 2011 on protection and hunting of beluga and narwhal No 21 of 22 September 2005 on protection and hunt of polar bears No 20 of 27 October 2006 on protection and hunting of walrus No 4 of 7 February 2013 on protection and hunting of large whales No 12 of 16 July 2010 on reporting from hunting and strike of large whales No 16 of 12 November 2010 on protection and hunting of seals

Catch registration form (1993-present) "*Piniarneq"*

ICELAND

Law	No 26, May 3, 1949 on whaling No 40, June 1, 1979 on amendments to Law No 26/1949 on whaling No 23, April 17, 1991 on amendments to Law No 26/1949 on whaling (cf. Law No 40/1979) No 92, July 1, 1991 on amendments to Law 26/1949 on whaling (cf. Law No 40/1979 and 23/1991)
Regulation	No 163, May 30, 1973 on whaling No 304, May 9, 1983 on amendments to Regulation No 163 of May 30, 1973 on whaling No 239, May 10, 1984 on amendments to Regulation No 163 of May 30, 1973 on whaling (cf. Regulation No 304/1983) No 862, October 17, 2006 on amendments to Regulation No 163 of May 30, 1973 on whaling (cf. Regulation No 304/1983 and 239/1984) No 822, September 14, 2007, on amendments to Regulation No 163 of May 30, 1973 on whaling (cf. Regulation No 304/1983, 239/1984 and 862/2006) No 456, May 19, 2008, on amendments to Regulation No 163 of May 30, 1973 on whaling (cf. Regulation No 304/1983, 239/1984, 862/2006 and 822/2007) No 58, January 27, 2009, on amendments to Regulation No 163 of May 30, 1973 on whaling (cf. Regulation No 304/1983, 239/1984, 862/2006, 822/2007 and 456/2008) No 263, Mars 9, 2009 on amendments to Regulation No 163 of May 30, 1973 on whaling (cf. Regulation No 304/1983, 239/1984, 862/2006, 822/2007, 456/2008 and 58/2009) No 359, April 6, 2009 on amendments to Regulation No 163 of May 30, 1973 on whaling (cf. Regulation No 304/1983, 239/1984, 862/2006, 822/2007, 456/2008 58/2009 and 263/2009) No 414, April 29, 2009 on the ban on whale hunting in specific areas.
Minke waling licenses	Rules in the licenses for minke whaling.

NORWAY

Act of 29 May 1981 No 38	Relating to Wildlife and Wildlife Habitats (the Wildlife act)
Act of 27 March 1999 No 15	Relating to the Right to Participate in Fisheries and Hunting
Act of 6 June 2008 No 37	The Marine Resources Act
Act of 19 June 2009 No 97	Animal Welfare

Executive Orders from the Department of Fisheries and Coastal Affairs:

31 March 2000	Regulation of the practice of hunting minke whales.
11 March 2003	Regulation of the practice of hunting seals in the West Ice and the East Ice

The Ministry of Fisheries and Coastal Affairs and the Directorate of Fisheries issues each year executive orders relating to the participation and governing of the hunt of Whales and Seals.

Appendix 2 List of references on hunting methods

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1.3 REPORT OF THE COMMITTEE ON INSPECTION AND OBSERVATION

The Committee on Inspection and Observation held a telephone meeting 22 January from 14:00 to 15:20 hrs. Online were: Nette Levermann Chair (Greenland), Eyþór Björnsson and Guðni Magnus Eriksson (Iceland), Hild Ynnesdal (Norway), and Ulla S Wang (Faroe Islands). Charlotte Winsnes attended from the Secretariat.

1. OPENING PROCEDURE

The Chair, Nette Levermann, welcomed the Committee members to the meeting. The draft agenda was adopted and the list of documents reviewed. The Chair and Charlotte Winsnes acted as rapporteurs.

2. THE 2014 SEASON

Presented under this agenda item were documents NAMMCO/IO-January/2015/2 containing the report from the Secretariat of the Observation Scheme for 2014 and NAMMCO/I&O-January /2015/3 containing the reports from the observer active in 2014.

Whaling and sealing in Greenland had been the focus of the observation scheme in 2014. One observer was contracted for the period 17 August to 5 September. No violations had been observed, and reports had been submitted to the Secretariat.

The Committee took note of the reports, and made a general comment on the continued importance of informing the hunters about NAMMCO and the rationale behind the observation scheme.

3. THE 2015 SEASON

Presented under this agenda item were documents NAMMCO/IO-January/2015/4 containing the scope and budget of the Observation activities for 2015.

The Committee had advised the Secretariat to presents the plans for coming observation activities with information on geographical area, planned effort compared to the total fleet/hunt when applicable and a more detailed budget.

The Committee agreed that it would be beneficial to be presented with the plans for the next season before Council received the documents, and gave their approval. In that way comments by the Committee could form a basis for the approval of Council.

The scope for 2015 is whaling in the Faroe Islands, budgeted with NOK 200 000. The suggestion is to send two observers, one from Greenland and one from Iceland, each covering different 25 days periods. Based on available information on pilot whale drive statistics, the high season is May to September – 5 months or 150 days. The suggested observation effort represents 1/3 of the high season and the Committee considered this to be good coverage.

4. UPDATE ON NATIONAL MONITORING DATA

The Faroe Islands do not have national inspectors. However the manner in which the hunt is regulated ensures the control and monitoring of the hunt trough the “Sysselman” and the foremen leading each hunt.

Norway confirmed that the electronic monitoring system (the blue box) continues to collect hunting data on each whaling vessel, and that inspectors are only used in cases of possible infringements. In 2014 no inspectors had been active on the whaling vessels. 23 licenses were given for the 2014 season of which 21 vessels participated which is an increase of 3 boats from 2013. The hunting period was from 1/4-25/9, no infringements reported.

With respect to sealing, there is a 100% control and monitoring effort as it is mandatory to have inspectors on board all vessels. Three vessels were active in 2014 in the West Ice, mainly in Greenlandic waters. The hunting season was from 10 April to 30 June but all vessels were back before 17 May. No infringements were reported.

Iceland informed that they had two inspectors on the fin whale hunt during two trips over a 7 days period. Two inspectors were also monitoring the minke whale hunt for 4 days. Iceland collected TTD data in the 2014

season including post-mortem examinations. Due to bad weather and technical problems with the hunting vessels, it was only possible to get enough data on the fin whale hunt.

Greenland informed that the wildlife officers as part of the regular national control have followed and controlled large whale hunts and beluga and narwhal hunts. The coverage is normally less than 2% of the hunting activities on large whales. In 2013, there were 6 reported infractions of national legislation on large whales. The infractions were related to the use of minke whale grenade for fin/humpback whale and cold harpoon used for minke whale as secondary weapon. Also reported, as infraction was the sale of whale products without prior stamping of sale license and hunting without proper license. Presently there are suggested changes to the job descriptions of the fishery inspectors in Greenland that can indicate that the inspectors will also be able to control and monitor hunting activities, something that would presumably increase the control and monitor effort in Greenland on marine mammals. There are only random control at sea on seal hunting thus it is mainly hunting permits that are controlled when coming to the harbor and later when the hunter is selling the products.

5. INFORMATION ON THE NAMMCO HOMEPAGE

The Committee had tasked the Secretariat to update the existing information and take steps to make the Committee itself and the Observation Scheme more visible and dynamic on the NAMMCO web page. The Secretariat informed the Committee that this was ongoing. The NAMMCO homepage is under reconstruction and the new page will probably be launched sometime in spring 2015. Much text has been added and more will come. The information on the existing homepage had been updated.

The Committee recommended that a clarification on the difference between observer and inspector be put on the homepage. The following text was agreed upon:

Observers have no authority (of jurisdiction) and consequently cannot intervene in the hunting or other activities connected with the hunting.

Inspectors are authorized by its national authorities to exercise control and if necessary to intervene in the hunting or other activities connected with the hunting. This authority is dependent upon a legal basis, and thus dependent on the relevant national legislation.

The Committee noted the report and asked that the text be circulated to the Committee for comments before going online. It was also recommended that documents like Rules of Procedure should be dated.

6. FOLLOW UP FROM THE LAST MEETING

The following points pertain to the Observation Scheme and were raised at the last meeting

- Control/check lists in relation to national legislation to be part of the observer kit. This is the responsibility of each member country. Norway and the Faroe Islands still needed to submit their lists with a deadline of April and June respectively.

Both Norway and the Faroe Islands will send these lists to the Secretariat before April 2015.

- Qualifications requirements for observers; the general rule is that an observer shall have at least the same level of professional competence as that required of inspectors in the country where the observations are to take place. The Committee reiterated its recommendation that information on competence requirements for inspectors must be circulated to all members as part of the nomination process. Duties of national inspectors vary between member countries due to differences in the activities which they control and it is essential that the qualification requirements are known to all member countries so that they are able to nominate competent people.

Member countries were asked to supply the Secretariat with information on qualification requirements of the national inspectors. Based on these inputs the Secretariat will compile an overview that will be circulated together with all other documents in the nomination process related to the Observation Scheme every year.

7. ELECTION OF OFFICERS

Greenland, represented by Nette Levermann, has held the chair the last 3 years. However Greenland has held the chair since 2005. The vice-chair is Faroe Islands and Ulla Svarrer Wang will now be the new chair with Norway as new vice-chair.

8. NEXT MEETING

In line with the decision made under agenda item 3. above, the Committee agreed to schedule the next meeting as a telephone meeting to be held in late September/early October. The exact date will be confirmed later.

9. REPORT OF THE MEETING

The report was approved by correspondence on 30 January 2015.

SECTION 2 MANAGEMENT COMMITTEES

2.1 REPORT OF THE MANAGEMENT COMMITTEE ON CETACEANS

4 February 2015, Reykjavik, Iceland

1. CHAIRPERSONS'S OPENING REMARKS

Chair Ulla Svarrer Wang welcomed all participants to the meeting.

2. ADOPTION OF AGENDA

The agenda was adopted (Appendix 1). The Chair informed the Management Committee (MC) that agenda Items 6.-9. would be discussed during the Joint Session with the MC on Seals & Walruses.

3. APPOINTMENT OF RAPPORTEUR

Jill Prewitt (Scientific Secretary) was appointed as rapporteur, with the help of participants when needed.

4. CONSERVATION AND MANAGEMENT MEASURES FOR WHALE STOCKS

For this agenda item, the Chair drew the attention of the MC to the following documents (Appendix 2):

- NAMMCO/23/MC/3 (Past proposals for Conservation and Management, Section 2.2, ANNEX 1)
- NAMMCO/23/MC/4 (Summary of Requests to the Scientific Committee, Section 2.2, ANNEX 2)
- NAMMCO/23/5 (Scientific Committee Report, item 8 and ANNEX 1, ANNEX 2) and
- NAMMCO/22/5 (Recommendations to member countries 2014).

4.1 Fin whales

East-Greenland –Iceland stock

West Greenland

Faroe Islands

Requests by Council for advice from the Scientific Committee

There are two active requests to the Scientific Committee:

R-3.1.7 (NAMMCO/17 09-2008): The SC is requested to complete an assessment of fin whales in the North Atlantic and also to include an estimation of sustainable catch levels in the Central North Atlantic.

R-1.7.12 (NAMMCO/22 - 2014): Greenland requests the SC to give information on sustainable yield based on new abundance estimates expected from TNASS2015 for all large baleen whales in West Greenland waters (NAMMCO 22).

Update from the Scientific Committee

Fin whale catches in Iceland had a very different distribution from previous years, with low catch rates on the traditional whaling grounds west of Iceland and the bulk of the total catch of 137 fin whales taken south of Iceland.

In 2013 a fin whale/blue whale hybrid was caught in the Irminger Sea west of Iceland. This is the fifth confirmed hybrid between these two species in Icelandic waters.

The SC **noted** that R-3.1.7 has been ongoing for some time while waiting for the IWC review. A Large Whale Assessment Working Group (LWAWG) meeting was previously planned for Fall 2014. This was postponed to Fall 2015, awaiting work to be completed by the IWC on the fin and minke whale *RMP Implementation Reviews*. The hope is that the IWC's work will be finished in spring. However, the SC noted that the LWAWG will meet this fall regardless of IWC progress, since NAMMCO needs to have interim advice.

Comments from the MC

Norway noted that the IWC may not complete their review this year.

The MC discussed why NAMMCO has been waiting for the work of the IWC SC. It was noted that NAMMCO's usual procedure is to avoid duplication of work and to use the work of the IWC SC as a basis for the NAMMCO work, however, the NAMMCO SC does not automatically accept the advice of the IWC SC.

Iceland **noted** that it is very important for the LWAWG to occur this autumn and **proposed** that the MC **amend** request R-3.1.7 to include the following additional text: "While long-term advice based on the outcome of the RMP Implementation Reviews (with 0.60 tuning level) is desirable, shorter term, interim advice may be necessary, depending on the progress within the IWC. This work should be completed before the annual meeting of the SC in 2015." The MC **endorsed** the amendment of R-3.1.7 to include this text.

Status of past proposals for conservation and management
There were no new updates from the past proposals for conservation and management.

Conclusions by the Management Committee
The MC **noted** the SC report, and looks forward to the outcome of the Large Whale Assessment Working Group in Fall 2015 which will address R-3.1.7.

4.2 Humpback whales

Greenland

Requests by Council for advice from the Scientific Committee
There are two active requests to the Scientific Committee:

R-3.2.4 (NAMMCO/15 03-2006): The Commission requested the Scientific Committee to conduct a formal assessment following the completion of the T-NASS.
R-1.7.12 (NAMMCO/22 - 2014): Greenland requests the SC to give information on sustainable yield based on new abundance estimates expected from TNASS2015 for all large baleen whales in West Greenland waters (NAMMCO 22).

Update from the Scientific Committee
The SC **noted** the new request (R-1.7.12) and will consider this again after NASS-2015.

Discussion of the MC
The MC noted that at last year's MC meeting, it was recommended that humpback whales not be considered at the Large Whale Assessment WG. However, the advice for removals in West Greenland is for 2010-2015. Greenland noted that the situation regarding quotas in the IWC is not stable, and that they do not want to risk a situation where they do not have advice from either the IWC or NAMMCO. Therefore Greenland would like to ask the SC whether there is sufficient data available to conduct an assessment of humpback whales at the upcoming Large Whale Assessment Working Group meeting in Fall 2015.

Greenland referred to the end of SC advice of humpback whales 2009-2015 and the risk of postponement of the NASS. Greenland also noted that a new quota negotiation in the IWC will be in 2018 and due to the uncertainty in allocation of quotas, Greenland proposed that R-3.2.4 is **reiterated** and ask that the assessment of humpback whales is completed at the Large Whale Assessment Working Group in fall 2015. The MC **endorsed** this reiteration of the request.

Status of past proposals for conservation and management
Proposal 3.7.1, regarding the advice for humpbacks for the period 2010-2015, was discussed above.

4.3 Sei whales

There is one active request for sei whales to the Scientific Committee:

Requests by Council for advice from the Scientific Committee

R-3.5.3 amended NAMMCO/19 09-2010: to assess the status of sei whales in West Greenland waters and the Central North Atlantic and provide minimum estimates of sustainable yield.
Update from the Scientific Committee

The SC considers R-3.5.3 as ongoing, and had no further updates or future plans for sei whales.

Discussion of the Management Committee
The MC noted that the IWC has been considering whether they will conduct an assessment on sei whales for many years. Most previous sightings surveys have not included sei whales as a priority species, and therefore the survey areas did not cover far enough south to obtain complete abundance estimates. Iceland noted that they were hoping to conduct a separate sightings survey with the primary focus on sei whales in the future. It was suggested that the previous estimates from 1989 and 1995, while acknowledged that they are likely underestimates, could be used as a minimum estimate to base some advice.

Conclusions by the Management Committee
The MC suggested that request R-3.5.3 remains a pending request, and notes that this work will not be completed by the SC in 2015. The MC also notes that there may be future work in the IWC.

There are no past recommendations for Scientific Research or recommendations to member countries.

4.4 Minke whales

Central North Atlantic
West Greenland

Requests by Council for advice from the Scientific Committee
There are two active requests to the Scientific Committee:

R-3.3.4 NAMMCO/17 09-2008: to conduct a full assessment, including long-term sustainability of catches, of common minke whales in the Central North Atlantic once results from the 2009 survey become available.
R-1.7.12 (NAMMCO/22 - 2014): Greenland requests the SC to give information on sustainable yield based on new abundance estimates expected from TNASS2015 for all large baleen whales in West Greenland waters (NAMMCO 22).

Update from the Scientific Committee
The SC will consider R-3.3.4 at the Large Whale Assessment Working Group meeting planned for fall 2015.

The SC **agreed** to use "common minke whale" as the common name for *Balaenoptera acutorostrata* going forward.

The SC noted the recent work on stock structure and genetics, which give no genetic support to maintain the 5 management areas in the northeast Atlantic. The SC noted that as a part of IWC's RMP Implementation Review, extensive revisions of management areas have been agreed. These include large reductions in the number of management areas. Although the latest genetic evidence suggests that there is only one stock in the North Atlantic, the IWC SC decided to retain the three main medium areas (E, Central, W) as a precautionary measure.

New abundance estimates were available from Norway, based on results from the sixth and last year of the 6-year survey programme 2008-2013 to cover the northeast Atlantic. Estimates were lower in the Jan Mayen area and also in Iceland. It was previously thought that the lower estimates seen in Iceland could be due to a shift in distribution, with the whales moving north to Jan Mayen, and/or toward the coast of East Greenland. Although the Jan Mayen area was surveyed in a different year than the Icelandic area, the lower estimates seen in Jan Mayen do not support a shift from Iceland to Jan Mayen.

Updates from the Management Committee
Iceland **proposed** amendments to request R-3.3.4 to be changed to the following text: "The SC is requested to complete assessments of common minke whales in the North Atlantic and include estimation of sustainable catch levels in the Central North Atlantic. While long-term advice based on the outcome of the RMP Implementation Reviews (with 0.60 tuning levels) is desirable, a shorter-term, interim advice may be necessary, depending on the progress within the IWC. This work should be completed before the annual meeting of the SC in 2015."

Norway reported on their 2014 catches of minke whales: the quota was set at 1,286, and the catch was 736 animals from 21 vessels.

Proposals for Conservation and Management
There were no updates on the past proposals. The MC **noted** that proposal 3.2.1 is outdated, however 3.2.2 should remain active.

Conclusions by the Management Committee
The MC **noted** the SC's plan to consider minke whales at the Large Whale Assessment WG in fall 2015. The MC **endorsed** Iceland's proposed amendments to R-3.3.4.

4.5 Narwhal

West Greenland
East Greenland

Requests by Council for advice from the Scientific Committee
There are two active requests to the Scientific Committee:

R-3.4.9 NAMMCO/14 03-2005: provide advice on the effects of human disturbance, including noise and shipping activities, on the distribution, behaviour and conservation status of belugas [also narwhal and walrus], particularly in West Greenland.
R-3.4.11 NAMMCO/17 09-2008: to update the assessment of both narwhal and beluga, noting that new data warrant such an exercise.

The MC agreed with the SC that R-3.4.10 (future surveys should be planned using hunter knowledge) is now considered completed.

The MC also agreed with the SC that R-3.4.12 (advice on sustainable takes of narwhal in Kane Basin) is included in R-3.4.11 and this request as replaced with 3.4.11.

Update from the Scientific Committee
The SC heard updates on new research projects including satellite tracking, sampling, and collection of stomach temperature data in Greenland.

The Catch Allocation Sub-Group of the NAMMCO-Joint Commission on Narwhal & Beluga met in March 2014 with the main purpose of developing an allocation model that will provide a mechanism for assigning harvested animals (narwhals) to summer stocks. Although the model is not yet completed, the SC was presented with the preliminary work of the Catch Allocation Sub-Group. The model will be completed at the upcoming NAMMCO-JCNB Joint Scientific Working Group meeting in March 2015. The full assessment will be updated at the March 2015 meeting as well.

Updates from the member countries
Greenland confirms report of the SC Chair and noted that the dates for the JCNB Commission meeting have not yet been confirmed, but the meeting will be held sometime before fall 2015.

Greenland informed the MC that in 2014 the Greenland Cabinet added 30 narwhals to the adopted quotas. Greenland noted that the 30 additional narwhals were an anomaly, and before 2014, and again in 2015, they are following the scientific advice.

The MC discussed that some years back there was concern that catches were higher than quotas. Greenland noted that while this may have been a concern in the past, the Department maintains close contact with the municipalities, with contact twice per month. Greenland has no concerns about the catch reporting, and trusts the current system.

Proposals for Conservation and Management

Proposal 3.3.6: The Management Committee strongly **recommends** that "struck and lost" data be collected from all areas and types of hunt and that all "struck and lost" animals be included in the advice (NAMMCO 19).

Greenland reported that there are no updates on the "struck and lost" issue, however reporting of "struck and lost" is still a requirement of the hunters.

Conclusions by the Management Committee
The MC notes the preliminary work of the Catch Allocation Sub-group and awaits the full model, as well as updated assessment, after the Joint Scientific Working Group of the JCNB meeting in March 2015.

The MC also noted that R-3.4.9 is being addressed by the planning of the Disturbance Symposium, and R-3.4.11 will be addressed at the upcoming NAMMCO-JCNB Joint Scientific Working Group meeting in March 2015 in Ottawa, Canada.

4.6 Beluga

West Greenland

Requests by Council for advice from the Scientific Committee
There is one ongoing request (R-3.4.9) and one standing request (R-3.4.11) to the Scientific Committee. These are both the same requests as discussed above for narwhal.

R-3.4.9 NAMMCO/14 03-2005: provide advice on the effects of human disturbance, including noise and shipping activities, on the distribution, behaviour and conservation status of belugas, particularly in West Greenland.
R-3.4.11 NAMMCO/17 09-2008: update the assessment of both narwhal and beluga

The MC agreed with the SC that R-3.4.10 (future surveys should be planned using hunter knowledge) is now considered completed.

Update from the Scientific Committee
The SC heard about an ongoing programme in Norway with satellite tracking and collection of blood and blubber sampling for various investigations of pollution, diet and health status of Svalbard belugas. Eight animals were captured for this purpose in the summer of 2014. At least one more field season will be needed before analysis will begin on data that has been collected.

As noted above, the NAMMCO-JCNB Joint Scientific Working Group will meet in March 2015. At this meeting they will update the advice for belugas, which will address R-3.4.11.

Updates from Member Countries
As noted above, Greenland informed the MC that the dates for the JCNB Commission meeting have not yet been confirmed, but the meeting will be held sometime before fall 2015.

Proposals for Conservation and Management
The MC noted that some of the past proposals for conservation and management are very old. There are no new updates.

Disturbance Symposium
As discussed in Council, the Scientific Committee **recommended** broadening the scope of the Symposium and including presentations from other species/research and noted that a number of external experts will be required for this meeting.

The SC members attending this meeting discussed a recent offer from a research group from the University of Leeds in the UK to join forces in planning the Disturbance Symposium. This group, and the members of the Disturbance Symposium Steering Committee, recommended to the MC that the Disturbance Symposium

Steering Committee discuss with the group from the University of Leeds whether their objectives overlap with the NAMMCO objectives to warrant collaboration on the symposium.

The MC endorsed this suggestion to broaden the scope of the meeting, and continue to discuss the possibility of collaboration with the University of Leeds group.

Global Review of Monodontids Planning

The planning for the Global Review of Monodontids was discussed in the Council meeting previously. The MC noted the current plans, and awaits updated information at next year's meeting.

4.7 Northern bottlenose whales

Update from the Scientific Committee

There is an ongoing project being conducted in Norway related to sonar noise disturbance on bottlenose whales. The SC noted that NAMMCO does not have an endorsed abundance estimate for the most recent sightings surveys. The latest available abundance estimate from the Icelandic and Faroese blocks of the ship-based part of the NASS-2001 survey were presented to the SC in 2003, but has not been formally endorsed.

Proposals for Conservation and Management

There is one very old proposal for conservation and management, 3.5.1. The MC noted that this conclusion is still valid as far as sustainability of any takes. However, the Faroes noted that the wording of the proposal is incorrect- there is not a direct traditional coastal drive hunt, but rather stranded animals that are found alive are permitted to be taken. The Faroes also noted that strandings are rare and in very low numbers.

Greenland updated the MC regarding the catch data that previously included bottlenose whales. The Department contacted the hunters and it was confirmed that bottlenose whales were a mistake in reporting, and that those catches were actually harbour porpoises. Greenland has now updated their catch records where this was possible.

Conclusions of the Management Committee

The MC took note of the report from the SC and endorses the changing of the wording in the proposal 3.5.1 to remove "traditional coastal drive hunt" and replace this with "strandings".

4.8 Killer whales

Greenland

Requests by Council for advice from the Scientific Committee

There is one active request to the Scientific Committee:

R-3.7.2 NAMMCO/13 03-2004: review the knowledge on the abundance, stock structure, migration and feeding ecology of killer whales in the North Atlantic (particularly W Greenland and E Canada), and to provide advice on research needs to improve this knowledge.

Update from the Scientific Committee

A 3-year research project on feeding behaviour, movements and acoustics of killer whales in Icelandic waters conducted by the MRI will be finalized in 2015. Photo-identification has revealed several instances of movement of killer whales between the Shetland Islands and Iceland.

Killer whales in SE Greenland were found to have tooth wear that looks like they are fish eating killer whales but seals were found in the stomachs. Ten years of observational and photo-identification data of a population of killer whales that follows the Norwegian spring-spawning stock of Atlantic herring were predominantly observed feeding upon herring. One pod of herring-eating whales was also observed interacting with seals. This supports the hypothesis based on the long-term markers, of a degree of specialization, with a small number of groups persistently feeding upon mammals, but switching between herring and seals. Playbacks of herring-eating killer whale sounds to harbour seals at haulout sites on the herring spawning grounds caused changes in behaviour consistent with an anti-predator response.

Concerning R-3.7.2, the SC noted that there is still not enough information to answer the request. Unfortunately, catch information in Greenland was not available for review by the SC at this meeting.

Updates from member countries
Greenland updated the MC that the work on validation of catch reporting is ongoing.

The MC notes that there is still not enough information for the SC to consider R-3.7.2. The MC also notes that it is important that the SC receive the National Progress Reports in a timely manner in order to give the best advice possible.

4.9 Long-finned pilot whales

Faroe Islands
Greenland

Requests by Council for advice from the Scientific Committee
There are four active requests to the Scientific Committee:

R-3.8.3 NAMMCO/13 03-2004: to develop a proposal for the details of a cost-effective scientific monitoring programme for pilot whales in the Faroes.
R-3.8.4 NAMMCO/16 02-2007: to make sure that both the methodology and the coverage of T-NASS take into account the need for reliable estimates for pilot whales. In addition, priority should be given to the analysis of data on pilot whales after the completion of T-NASS.
R-3.8.5 NAMMCO/19 09 2010: to assess the status of long-finned pilot whales in West Greenland waters and provide minimum estimates of sustainable yield.
R-3.8.6 NAMMCO/20 09 2011: to continue work to complete a full assessment of pilot whales in the North Atlantic and provide advice on the sustainability of catches, and to provide a general indication of the level of abundance of pilot whales required to sustain an annual catch equivalent to the annual average of the Faroese catch in the years since 1997.

Update from the Scientific Committee
Efforts have increased in the sampling programme of harvested animals, prioritizing obtaining teeth for ageing, skin samples, and reproductive parameters for each animal. A total of 270 animals were sampled in 2013. This sampling scheme is related to R-3.8.3.

The SC noted that all of the requests regarding pilot whales are ongoing, and the next assessment will not occur until after the next sightings survey.

The SC also noted that pilot whales are a priority species for NASS-2015, and the planning includes increased survey effort and new techniques such as drones in order to obtain the best abundance estimate possible.

Proposals for Conservation and Management
With regards to proposal 3.6.1 and R-3.8.3, part of which concerned continuing with sampling of pilot whales, the MC notes and welcomes the update from the SC that the sampling program has been prioritised and many samples were collected in 2013.

Conclusions by the Management Committee

The MC notes the SC report and welcomes the progress on the sampling programme in the Faroes. The MC also awaits new abundance estimates resulting from NASS-2015.

4.10 White-beaked, white-sided and bottlenose dolphins

Requests by Council for advice from the Scientific Committee
There is one active request to the Scientific Committee:

R-3.9.6 NAMMCO/13 03-2004: to carry out assessments of these species (white-beaked, white-sided and bottlenose dolphins).

Update from the Scientific Committee

With regards to R-3.9.6, the SC noted that there is no new information for bottlenose dolphins from the Faroes and the analysis of the data from white sided dolphins in the Faroes is awaiting completion.

Updates from member countries
The Faroes noted that with respect to harvest of white-sided dolphins, in previous years there were stable catches from year to year, however in more recent years, catches have been close to zero. Interest in dolphins has waned, and therefore new research has not been prioritised. The previous work will be completed.

Conclusions by the Management Committee
There are no proposals for conservation and management. The MC notes the SC report and awaits the analysis of the white-sided dolphin data from the Faroe Islands.

4.11 Harbour porpoise

Greenland
Norway
Iceland

Requests by Council for advice from the Scientific Committee
There is one active request to the Scientific Committee:

R-3.10.1 NAMMCO/7 05-1997: comprehensive assessment of the species throughout its range…including distribution and abundance, stock identity, biological parameters, ecological interaction, pollutants, removals and sustainability of removals.

Update from the Scientific Committee
Satellite tagging of harbour porpoises continues in West Greenland. Greenland also sampled about 150 porpoises from the hunt from June-October to complement previous sampling efforts from September 1995 and 2009 and to look at possible seasonal changes. The porpoises seem to react positively to climate change in terms of increased body mass. Stomach contents showed increased diversity of prey between 1995–2009, with large amounts of cod in 2009.

A future harbour porpoise WG will be scheduled after a report from the By-catch WG, new data from T-NASS2015, and progress on research requests from the 2013 Harbour Porpoise Working Group.

Proposals for Conservation and Management
Regarding the recommendations to member countries from 2014, Greenland informed the MC that they hope that new tagging data and surveys will help inform the SC on the assessment work. Greenland also noted that the work on catch history validation data is ongoing.

There was no new information from Norway.

Conclusions by the Management Committee
The MC noted the SC report.

4.12 Sperm whale

Update from the Scientific Committee
There was no updates or future work reported at the SC.

Conclusions by the Management Committee
There are no proposals for conservation and management, and the MC notes the SC report.

4.13 Bowhead whale

East Greenland - Svalbard
West Greenland

Requests by Council for advice from the Scientific Committee

The only request to the Scientific Committee relating to bowheads is R-1.7.12 (regarding all baleen whales in West Greenland), which awaits the results from NASS-2015.

Update from the Scientific Committee
A new abundance estimate for the population of bowhead whales in West Greenland using genetics is larger than from aerial surveys, probably because of segregation of animals that mostly summer in the Canadian High Arctic. These results confirm an earlier assumption based on data that showed 83% of the whales passing through West Greenland were females, and older than 40 years, therefore the population must consist of more animals.

The programme using passive acoustic monitoring devices for bowhead whales in Framstredet and north of Svalbard is ongoing. Four units were deployed in 2013 and 3 retrieved and redeployed in 2014.

Updates from Member Countries
Greenland informed the MC that there were no catches of bowhead whales (none of the annual quota of 2 whales was used) between 2012 and 2014, but they wish to keep part of this shared Canadian/Greenlandic quota based on the advice from the Scientific Committee of the IWC.

Conclusions by the Management Committee
There are no proposals for conservation and management, so the MC notes the SC report.

4.14 Blue Whale

This species is new on the agenda this year, but it was discussed at the SC so it has been added here. There are no requests to the SC.

Update from the Scientific Committee
Animals identified earlier via photo-id off West Iceland in mid-summer were identified north of Iceland in mid-summer in recent years. One blue whale was satellite tagged in 2013 and two in 2014 north of Iceland. The whale tagged in mid July 2013 travelled southwards to 59° N. The whales tagged in 2014 travelled north of Iceland towards 73° N. There has been a notable increase in the numbers of blue whales seen in Svalbard over the last 2–3 years. This year there were also many sightings during the Norwegian Sightings survey and the Arctic part of the Ecosystem survey. Perhaps those whales moving north from Iceland to the Svalbard area.

Iceland has been collecting biopsies and has 10-20 samples currently being stored in the MRI archive.

Conclusions by the Management Committee
The MC notes the SC report and welcomes the new information on this species.

5. T-NASS 2015 AND SURVEY PLANNING

Requests by Council for advice from the Scientific Committee

R-1.7.11: NAMMCO/16 2007: …to develop estimates of abundance and trends as soon as possible, with the primary target species (fin, minke and pilot whales) as a first priority, and secondary target species (e.g. sei whales) as a second priority.
R-1.7.12 NAMMCO/22 2014: to give information on sustainable yield based on new abundance estimates expected from TNASS2015 for all large baleen whales in West Greenland waters (NAMMCO 22).

Update on status of NASS-2015
The MC notes and agreed with the SC recommendation that the "T" will be dropped from TNASS2015, reflecting the reality that the planned survey is not a "Trans-Atlantic" survey, , given that there will not be coverage in the West Atlantic.

The MC noted the previous update on the status of NASS-2015 during the Council meeting. The main points were:

- Faroe Islands have full funding for national and extension surveys

- Iceland has received approval for ¾ of their requested funds to cover the national and extension survey
- Norway has approval for the funds for the national portion of their survey, but not the extension survey
- Greenland will not have updated funding information before June 2015
- NAMMCO will submit a proposal to the government of Norway for funding for the extension surveys. A decision on this is expected in mid-March
- The Steering Committee noted that while it may be possible to conduct a survey with this late of a funding decision, survey platforms such as ships and aircraft may not be available

Iceland also informed the MC that it is hoped that by installing double platform observation effort on fisheries research surveys, they hope to have comparable coverage as in the last NASS in 2007.

Iceland and Greenland **proposed** that the MC **reiterate**, and **amend** R-1.7.11 to include humpback whales, to read as follows: "Once the survey has been completed, the Scientific Committee is requested to develop estimates of abundance and trends as soon as possible, with the primary target species (fin, common minke, humpback and pilot whales) as a first priority, and sei whales as a secondary species."

MC **endorsed** both the reiteration and amendment to R-1.7.11.

MC also noted the interval between sightings surveys is approaching the maximum recommended and hopes that NASS-2015 will continue as scheduled in 2015. The MC notes that results from NASS-2015 will take some time but hopes that results will come as soon as possible.

6.-9. Joint Session
Agenda items 6. to 9. were discussed in a joint session with the Management Committee for Seals and Walruses. Discussions on these agenda items can be found in the Report of the Management Committee for Seals and Walruses (NAMMCO/23/8).

10. Any other business

10.1 Elections
Iceland proposed that the Faroe Islands (Ulla Svarrer Wang) serve a second term as Chair of the Management Committee for Cetaceans. Ulla S. Wang thanked Iceland for the proposal and agreed to continue as Chair with another term.

Norway proposed that Greenland (Nette Levermann) continues as Vice Chair Chair of the Management Committee for Cetaceans, and Greenland accepted the proposal.

Appendix 1 Agenda

1. CHAIRMAN'S OPENING REMARKS

2. ADOPTION OF AGENDA

3. APPOINTMENT OF RAPPORTEUR

4. CONSERVATION AND MANAGEMENT MEASURES FOR WHALE STOCKS

4.1 Fin whales

East-Greenland –Iceland stock
West Greenland
Faroe Islands

- Requests by Council for advice from the Scientific Committee
- Proposals for Conservation and Management
- Updates

4.2 Humpback whales

Greenland

- Requests by Council for advice from the Scientific Committee
- Proposals for Conservation and Management
- Updates

4.3 Sei whales

- Requests by Council for advice from the Scientific Committee
- Updates

4.4 Minke whales

Central North Atlantic
West Greenland

- Requests by Council for advice from the Scientific Committee
- Proposals for Conservation and Management
- updates

4.5 Narwhal

West Greenland
East Greenland

- Requests by Council for advice from the Scientific Committee
- Proposals for Conservation and Management
- Updates

4.6 Beluga

West Greenland

- Requests by Council for advice from the Scientific Committee
- Proposals for Conservation and Management
- Updates
- Disturbance Symposium planning
- Global Review of Monodontids planning

4.7 Northern bottlenose whales

- Proposals for Conservation and Management
- Updates

4.8 Killer whales

Greenland

- Requests by Council for advice from the Scientific Committee
- Updates

4.9 Long-finned pilot whales

Faroe Islands
West Greenland

- Requests by Council for advice from the Scientific Committee

- Proposals for Conservation and Management
- Updates

4.10 White-beaked, white-sided and bottlenose dolphins

- Requests by Council for advice from the Scientific Committee
- Updates

4.11 Harbour porpoise

Greenland
Iceland
Norway

- Requests by Council for advice from the Scientific Committee
- Proposals for Conservation and Management
- Updates

4.12 Sperm whale

- Updates

4.13 Bowhead whale

East Greenland - Svalbard
West Greenland

- Updates

4.14 Blue Whale

- Updates

5. T-NASS 2015 AND SURVEY PLANNING

- Proposals for Conservation and Management
- Updates

6. PROCEDURES FOR DECISION-MAKING ON CONSERVATION AND MANAGEMENT MEASURES

6.1 General Models[1]

7. ECOSYSTEM-BASED MANAGEMENT[2]

8. USER KNOWLEDGE IN MANAGEMENT DECISION-MAKING[3]

9. RELATED MANAGEMENT ISSUES[4]

9.1 Marine mammal - fisheries interactions
9.2 Environmental questions
9.3 By-catch data and monitoring
9.4 Other topics

10. ANY OTHER BUSINESS

10.1 Elections

[1] **Agenda item 6:** Overlap with the Management Committee for Seals and Walruses, and could be discussed in a joint meeting of the two Management Committees if desired.
[2] **Agenda item 7:** Overlap with the Management Committee for Seals and Walruses, and could be discussed in a joint meeting of the two Management Committees if desired.
[3] **Agenda item 8:** Overlap with the Management Committee for Seals and Walruses, and could be discussed in a joint meeting of the two Management Committees if desired.
[4] **Agenda item 9:** Overlap with the Management Committee for Seals and Walruses, and could be discussed in a joint meeting of the two Management Committees if desired.

Appendix 2 List of documents

Document no	Title	Agenda item
NAMMCO/23/MC/1	List of Documents	
NAMMCO/23/MC/2	Draft Agenda	2.
NAMMCO/23/MC/3	Status of Past Proposals for Conservation and Management	4., 5., 6., 7. and 9.
NAMMCO/23/MC/4	Summary of Requests by NAMMCO Council to the Scientific Committee, and Responses by the Scientific Committee	4.
NAMMCO/23/MC/5	Recommendations to member countries 2014	4.
NAMMCO/23/5 and ANNEXES 1 and 2	Report of the Twenty-first Meeting of the Scientific Committee	4., 5., 6., 7. and 9.

2.2 REPORT OF THE MANAGEMENT COMMITTEE FOR SEALS AND WALRUS

4 February 2015, Reykjavik, Iceland

1. CHAIRPERSON'S OPENING REMARKS

The Chair, Hild Ynnesdal, Norway, opened the meeting and welcomed all participants.

2. ADOPTION OF AGENDA

The agenda was adopted noting that agenda items 6. Trade issues changed place with agenda item 5. and that items 6. to 9. would be discussed in a joint session with the Management Committee for Cetaceans. The report from the joint session is part of this report. The meeting documents were reviewed. Agenda and list of documents are contained in Appendices 1 and 2 respectively.

3. APPOINTMENT OF RAPPORTEUR

The Secretariat was appointed as rapporteur.

4. CONSERVATION AND MANAGEMENT MEASURES FOR SEAL STOCKS

The Chair drew attention to the following documents:

- NAMMCO/23/MC/3 summarising past proposals for conservation and management and responses to these (Section 2.2, ANNEX 1)
- NAMMCO/23/MC/4 summarising past requests to the Scientific Committee and responses. (Section 2.2, ANNEX 2)
- NAMMCO/23/SMC/5 listing recommendations to member countries in 2014.

There were no new proposals for conservation and management to member countries or recommendations to member countries arising from the meeting.

The vice-chair of the Scientific Committee, Tore Haug, presented the information on seal and walrus stocks from the Scientific Committee report (NAMMCO/23/5) under each species.

4.1 Harp Seals

In 2014 Greenland had agreed to send a new request to ICES in order to finalize the assessment on the Northwest Atlantic stock, because the results from the last surveys in 2013 had not been ready, and therefore not been dealt with at the last WGHARP meeting in August 2013.

Greenland had sent a request to ICES that somehow had not been received in the right department. The WG on harp ad hooded seals had therefore not discussed this request at its last meeting in November 2014. SC will have to discuss the issue once a response has been received.

Requests by Council for advice from the Scientific Committee

R-2.1.4 - NAMMCO/12-2003 (standing): to regularly update the stock status of North Atlantic harp and hooded seals as new information becomes available.

R-2.1.6 – NAMMCO/14-2005 (ongoing): to evaluate how a projected decrease in the total population of Northwest Atlantic harp seals might affect the proportion of animals summering in Greenland.

R-2.1.10 – NAMMCO/17-2008 (standing): to provide advice on Total Allowable Catches for the management of harp seals and the establishment of a quota system for the common stocks between Norway and the Russian Federation, leaving full freedom to the Committee to decide on the best methods to determine this parameter based on an ecosystem approach.

R-2.1.11 - NAMMCO/18-2009 (pending): to evaluate how a projected increase in the total population of Northwest Atlantic harp seals might affect the proportion of animals summering in Greenland.

Advice from the Scientific Committee

The ICES Working Group on Harp and Hooded Seals (WGHARP) had not met prior to the NAMMCO Scientific Committee meeting. The Scientific Committee had therefore not been in a position to assess and give advice on the catch potential of harp seals stock in the Barents Sea/White Sea and in the Northwest Atlantic.

The Scientific Committee had reviewed the list of ongoing request and noted that requests R-2.1.6 and R-2.1.11 were completed.

Other information
Aerial surveys were carried out by PINRO in March 2013 yielded a total pup production number of the White Sea/Barents Sea harp seal population of 128,786.

In Norway the Marine Research Institute (IMR) has now started experiments with Unmanned Aerial Vehicles (Drones) to perform aerial photographic surveys of harp and hooded seal whelping patches on the drift ice. With some technical improvements on both aircrafts and operational equipment a new survey, will be conducted in the West Ice in 2015.

Photographic and visual aerial surveys had been conducted off Newfoundland and in the
southern Gulf of St. Lawrence in 2012. This resulted in an estimated total pup production of 790,000 of Northwest Atlantic harp seals. This estimate is approximately half of the estimated number of pups born in 2008, likely due to lower reproductive rates in 2012 compared to 2008.

A population model had been used to examine changes in the size of the total Northwest Atlantic harp seal population between 1952 and 2014. The total population size in 2012 were estimated to be 7,445,000, and appears to be relatively stable, showing little change in abundance since the 2004 survey, although pup production has become highly variable among years.

Discussion
Norway reported that the catches of harp seals in the West Ice had been of the same magnitude as in the 1980s. Of the quota of 21 270 animals, 7 116 had been caught. There has been no hunt in the Barents Sea since 2009.

Greenland informed that they as in previous years had given Norway permission for scientific work on seals and Norwegian sealing vessels permission to hunt within Greenland EEZ in 2014.

Canada informed that in 2014 54 000 animals had been caught of a total quota of 400 000.

Russia informed that the hunt in the Barents Sea most probably would be carried out in 2015.

Conclusion
The Management Committee took note of the report from the Scientific Committee. It was noted that the ICES WG on harp and hooded seals had not met at the time of the SC meeting and as a result assessments of both the White Sea/Barents Sea and the Northwest Atlantic harps seals stocks was not yet finalised. Furthermore it was noted that requests R-2.1.6 and R-2.1.11 were completed.

The Committee asked the Secretariat to find out the correct procedure for forwarding requests to ICES in the future when it is a joint ICES / NAFO / NAMMCO working group.

There were no recommendations for new scientific research or recommendations to member countries.

4.2 Hooded Seals
In 2014 the Management Committee for Seals and Walruses recommended a commercial catch level of zero only allowing limited research catches.

Norway informed that 24 animals had been taken for the purpose of scientific research.

Requests by Council for advice from the Scientific Committee

R-2.1.4 - NAMMCO/12-2003 (standing): to regularly update the stock status of North Atlantic harp and hooded seals as new information becomes available.
R-2.1.9 – NAMMCO/16-2007 (ongoing): to investigate possible reasons for the apparent decline of the Greenland Sea stock of hooded seals; assess the status of the stock on basis of the results from the survey in 2007.

Update from the Scientific Committee
As was the case for the harp seals, the Scientific Committee had not been in a position to answer the request since the ICES Working Group on Harp and Hooded Seals (WGHARP) had not met prior to the NAMMCO Scientific Committee meeting.

Discussion and conclusion
The Management Committee took note of the report from the Scientific Committee. It was noted that the ICES WG on harp and hooded seals had not met and as a result assessments of the Northwest Atlantic hooded seals stocks was not finalised.

There were no recommendations for new scientific research or recommendations to member countries.

4.3 Ringed Seals

Requests by Council for advice from the Scientific Committee
R-2.3.1- NAMMCO/5-1995 (standing): 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 present removals in each stock area, effects of recent environmental changes (*i.e.* disturbance, pollution) and changes in the food supply, and interactions with other marine living resources.
R-2.3.2 - NAMMCO/7-1997 (standing): to advice on what scientific studies need to be completed to evaluate the effects of changed levels of removals of ringed seals in West and East Greenland.

Advice from the Scientific Committee
There is still not sufficient information on stock structure and size to give answers to the requests. Last year the SC had suggested convening a Working Group in 2015/2016. In light of the work taking place under the Arctic Council working group "Conservation of Arctic Flora and Fauna" (CAFF), the SC had agreed to await the outcome of the work of CAFF before proceeding with the NAMMCO Working Group.

Discussion
Greenland raised concern over the work being done in the Arctic Council CAFF on ringed seals. The main focus of ringed seals in CAFF is related to it being the prey of the polar bears and the climate change issue.

Conclusions
The Management Committee took note of the report from the Scientific Committee. There is still not enough information to answer the request. The proposed NAMMCO WG on ringed seals will await the work of the Arctic Council CAFF WG on this species.

There was no recommendation for new Scientific Research or recommendations to member countries.

4.4 Grey Seals

Requests by Council for advice from the Scientific Committee
R-2.4.2 - NAMMCO/11-2002 (standing): provide a new assessment of grey seal stocks throughout the North Atlantic.

Advice from the Scientific Committee
Norway
The most recent pup production estimate of grey seals in Norway is based on data obtained in 2006–2008. The present management plan for coastal seals in Norway require that data be updated every 5 years. A boat-based visual survey aimed to obtain a new abundance estimate for the species in Norway started in November 2013 and continued in 2014. Some of the new estimates obtained in mid Norway were much lower than in the previous survey, and quotas were immediately reduced in these areas as a result.

The current surveys, aimed to obtain a new pup production estimate for the entire Norwegian coast, will be completed in 2015. If possible, Russia and Norway will conduct a joint survey of grey seals on the Murmansk Coast - these grey seal colonies have not been surveyed since
1991.

There was little new information to report from Iceland, Greenland and the Faroe Islands on grey seals.

The Scientific Committee has rescheduled the Coastal Seals Working group meeting to February 2016 to address R-2.4.2 and R-2.5.2. By February 2016, the CSWG will likely have by-catch estimates and a new complete grey seal estimate in Norway for consideration at the meeting.

The Terms of Reference:
1) assess the status of all populations, particularly using new abundance estimate data that are available from Iceland and Norway.
2) address by-catch issues (grey seals) in Norway, Iceland, and the Faroe Islands
3) re-evaluate the Norwegian management plans (which have been already implemented) for grey and harbour seals.

Discussion
Norway informed the meeting that in 2014 the quota was 406 of which 208 was hunted.

Conclusions
The Management Committee took note of the report from the Scientific Committee and endorsed that the Working Group on Coastal seals meet in February 2016 in order to finalise requests 2.4.2 and 2.5.2. By that time the new grey seals estimate in Norway will be ready.

There was no recommendation for new Scientific Research or recommendations to member countries.

4.5 Harbour Seals

Requests by Council for advice from the Scientific Committee
R-2.5.2 - NAMMCO/16-2007 modified **NAMMCO/19-2010** (pending): To conduct a formal assessment of the status of harbour seals for all areas as soon as feasible.

Advice from the Scientific Committee
In Norway aerial surveys aimed to obtain a new abundance estimate were started in 2011 and continued in 2012 and 2013. The results from these surveys were supplemented with results from boat-based visual surveys in 2014, resulting in a final point estimate of 7,533 for the entire Norwegian coast. The new estimate has been implemented in the 2015 management following the plan reviewed by NAMMCO SC in 2011.

Norwegian catch statistics do not include by-catch removals. Norway is now in the process of developing a model for management of harbour seals, which will include uncertainties around by-catch.

In 2011, Iceland estimated the harbour seal population to be around 12.000 animals, which is just on the border to the recommended population size. In 2014 a partial survey was carried out, representing 62% of the area of the 2011 count. The results from the study indicate a ~30% annual decrease between 2011 and 2014. The numbers are preliminary and deducted from partial area coverage. However, if applicable it shows a much smaller population than the recommended number of 12.000 animals. If funding is secured the plan is to carry out a new count in 2015 covering the whole of Iceland.

Norway informed the meeting that in 2014 the quota was 425 of which 406 was hunted.

Conclusion
The Management Committee took note of the report from the Scientific Committee and notes that the Working Group on Coastal seals meet in February 2016 in order to finalise requests R-2.4.2 and R-2.5.2.

There was no recommendation for new Scientific Research or recommendations to member countries.

4.6 Bearded seal

Since 2009 the Management Committee has recommended that the status of this species be assessed.

The Chair noted that there is no request for advice from the Scientific Committee on this species.

Update from the Scientific Committee

The Scientific Committee communicated that some limited satellite tracking of bearded seals is on-going and continuing in Svalbard and Greenland. However it was noted that this species like the ringed seal is suffering from the new ice conditions.

Conclusion

The Management Committee reiterates the conclusion from the last meeting that there is still not much information on bearded seals, and that this probably reflects that this is not a target species for NAMMCO members.

There is no recommendation for new Scientific Research or recommendations to member countries.

4.7 Walrus

In 2014 Greenland was recommended to undertake the following scientific research:

- That new estimates of sex and age structure of the catch for West Greenland are obtained. The sex determination that is reported by the hunters should be validated using genetics.
- That the fraction of the catches and abundances in Canada that belong to the West Greenland/Baffin Island population are clarified.
- That complete catch statistics from Canada are collated.
- That reliable reports of struck and lost are obtained for the entire range of the stocks in Greenland and Canada.

As response to the MCS Chair, Greenland informed the meeting that Greenland complies to the NAMMCO biological advice in all management areas but one when allocating quota. The Government of Greenland is not following the biological advice from NAMMCO in one management area (Qaanaaq). The Government of Greenland has decided to use a struck and lost rate of 3 % and not 15 %. The 3% rate was based on specific interviews with the experienced hunters from the area. Greenland also informed that the below mentioned interview report suggests a struck and lost rate of 5 % in Qaanaaq area. The issue will be subject to evaluation according to the existing rate of 3 %.

Requests by Council for advice from the Scientific Committee

R-2.6.3 - NAMMCO/15-2006 (ongoing): provide advice on the effects of human disturbance, including fishing and shipping activities, in particular scallop fishing, on the distribution, behaviour and conservation status of walrus in West Greenland.

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Advice from the Scientific Committee

The 2013 quota assessments for West Greenland has been much debated and it was decided to carry out a supplementary survey of the northern stock (Baffin Bay stock in NW Greenland, Qaanaaq area) in April as a supplement to previous surveys that were conducted in May–June when the walruses are more dispersed in the North Water. This survey, completed in early April 2014 shows promising results and should allow for a new abundance estimate to be developed soon. Together with updated hunting statistics, this new abundance estimate could be used for a revised assessment for this particular stock with a possible update on advice.

The Scientific Committee suggested that the Walrus Working Group meet one day in March 2015 to address possibilities to update advice on sustainable takes of walrus from the Baffin Bay stock.

Other information

In new a project in Svalbard sponsored by the Norwegian-Russian Environmental Commission 20 adult male walruses were instrumented with GPS loggers in 2014 and should collect GPS positions for at least five years. Blood and blubber samples were collected from these animals for various studies. New methods resulted in 0 mortality.

Newly published results from the recent survey of walrus haulout sites in Svalbard provides updates regarding the increasing numbers of land- based haulout sites, occupied sites, sites with mother-calf pairs, and a 48% increase in abundance in the six-year period between the two surveys to 3,886 (CI: 3,553-4,262) animals, including animals in the water at the time of the survey.

Discussion

Greenland reported the following quota and catch data for 2014 and quota for 2015:

	2014		2015
	Quota	Catch	Quota
North Water (Qaanaaq)	61	67	86 (minus 3)
West Greenland	61	52	69
East Greenland	18	08	18

The non-accumulating carry-over (also in use for narwhal and beluga) is in function so non-used quota from 2014 will be allocated on top of the basic quota on walrus. Greenland also informed that the Institute of Natural Resources in Greenland is in its final process to finalize a report on interview with hunters in North Greenland on traditional knowledge, incl. struck and lost on walrus. The report will be presented at NAMMCO at its next year's meeting.

Conclusion

The Management Committee took note of the report from the Scientific Committee. The Management Committee furthermore endorsed the recommendation to update advice on sustainable takes of walrus from the Baffin Bay stock, and that this be organised through a one day teleconference.

5. TRADE ISSUES AND THE EU BAN OF IMPORT OF SEAL PRODUCTS

The WTO Appellate Body's report in the seal case was published on the 22nd of May 2014. The report confirms that EUs regulation is arbitrary and unjustifiably applied and is therefore inconsistent with EU's WTO obligations.

The parties to the case have agreed that EU be given until the 18th of October 2015 to bring its measure in conformity with WTO rules. The EU has taken steps to do so with regard to seal products stemming from Canada's inuit hunt.

For the time being, there is no specific information indicating the specific details on how the EU will comply with the Appellate Body's (AB) report pertaining to sustainable resource management hunt.

Greenland emphasised that seals represents a resource, which should be utilized like any other marine resource, and that they are opposed to the ban and the exemptions. Parts of the ban had to be changed in accordance to the verdict, and Greenland will work against any changes of the Inuit Exemption making it more difficult to export the skins to the EU.

In relation to the process of becoming a certifying body, there has been exchange of information with Canada/Nunavut during bilateral meetings on the difference of the two sealhunts and trade-possibilities, which mainly is based on the historic and infra-structural difference in development of the sealskin industry in the two areas.

Norway stated that they were pleased to note that the AB report in the seal case confirms that EUs regulation is inconsistent with the EU's WTO obligations. It is anticipated that the EU will comply with the AB report and remove or amend the discriminating exceptions from the regulation. For Norway, the sealing industry is of limited economic value, but EUs trade restrictions are a matter of principle concerning market access for renewable marine resources

The Management Committee noted the views expressed by Greenland and Norway.

JOINT SESSION

It was agreed that agenda items 6. Procedures for decision making on conservation and management measures, and agenda item 7. ecosystem-based management would be dealt with under agenda item 9. Related management issues.

8. USER KNOWLEDGE IN MANAGEMENT DECISION-MAKING

Requests by Council for advice from the Scientific Committee

R-1.8.1 :need for greater input from hunters in the work of the SC
R-1.8.2 :SC report language must be kept precise and simple

The Management Committee noted that these are now part of the SC working procedures and agreed that these request were completed.

9. RELATED MANAGEMENT ISSUES

9.1 Marine mammal – fisheries interactions

Requests by Council for advice from the Scientific Committee

R-1.2.1: developing multispecies models for the North Atlantic (ongoing)
A large-scale ecosystem modelling project (MAREFRAME) is underway, which includes marine mammals in Icelandic and adjacent waters.
R-1.2.2: monitor stock levels and trends in stocks of all marine mammals in the North Atlantic (standing request)

The Scientific Committee had reviewed the various requests under this agenda item and had agreed to the following:

With regards to **R-1.1.2** (fisheries interactions in the Davis Strait ecosystem) this was considered outdated.

Request **R-1.1.5** (interactions between marine mammals and commercially exploited marine resources) should remain as a standing request and also takes the place of **R-1.1.3** (impact of marine mammals on the ecosystem, especially economically important fish species).

R- 1.1.8 (ecosystem modelling and marine mammal fisheries interactions): This request should remain ongoing until the results expected from Iceland are presented in the SC.

R-1.4.1 to 1.4.6: This series of requests are all regarding the economic aspects of marine mammals-fisheries interactions. The SC regards these requests as **outdated** and if the Management Committee would still like these issues addressed, a new, more specific request should be drafted. The SC also noted that socioeconomic impacts are included in a large-scale ecosystem modelling project (MAREFRAME) which includes marine mammals in Icelandic
and adjacent waters.

Other information

The traditional perception of prey species preference of killer whales in the Northeast Atlantic has, to a large extent, been linked to herring. Recent Norwegian research on the ecology of killer whales in the Norwegian Sea during two summer-season ecosystem-based surveys 2006 and 2007, quantified spatial overlap between killer whales and the three most common pelagic fish species. No spatial elationships were found with herring or blue whiting. However, a significant relationship and spatial overlap with mackerel. Killer whale group size was also correlated to the size of mackerel trawl catches, indicating active group size adjustment to available prey concentrations.

In the years 2007–2011 a high priority part of the planned Joint Norwegian-Russian Research Programme on Harp Seal Ecology was to deploy satellite transmitters in the White Sea. Permits by the Russian Authorities were first given in 2012–2014, but unfortunately a lack of funding then prevented tagging. An application for funding has now been submitted to the Norwegian Research Council, and during the tagging experiment, PINRO will provide the necessary logistics required for helicopter- or boat-based live catch of seals in April–

May 2015. For proper planning and budgeting in both nstitutes, a PINRO scientist must obtain the necessary permissions from Russian authorities before December 2014.

Iceland suggested the following new request for scientific advice:

The Scientific Committee is requested to review the results of the MAREFARAME ecosystem management project when these become available. In particular, the results should be reviewed with respect to the ongoing and standing requests on marine mammal interactions (R1.1.0) and multispecies approaches to management (R 1.2.0).

Conclusion
The Management Committee took note of the report from the Scientific Committee. It noted that requests 1.1.2 and 1.4.1.to 1.4.6 were all outdated, and that request 1.1.5 took the place of 1.1.3.

The Management Committee further agreed to recommend to Council the request that the Scientific Committee review results from MAREFRAME project as described above.

9.2 Environmental questions
In regards to **R-1.5.1** (radioactive material entering the North Atlantic ecosystem), the Scientific Committee considers this request outdated.

Conclusion
The Management Committee noted that request R-1.5.1 was outdated. The remaining part of the report from the Scientific Committee under this agenda item was presented in Council and there were no further discussion in the Management Committee.

9.3 By-catch data and monitoring
The report from the Scientific Committee under this agenda item was presented in Council and there were no further discussion in the Management Committee.

9.4 Other topics
No issues were raised on the agenda.

10. ANY OTHER BUSINESS
No issues were raised on the agenda.

Appendix 1 Agenda

1. CHAIRMAN'S OPENING REMARKS

2. ADOPTION OF AGENDA

3. APPOINTMENT OF RAPPORTEUR

4. CONSERVATION AND MANAGEMENT MEASURES FOR SEAL STOCKS

4.1 Harp Seals

White / Barents seas
Greenland Sea
Northwest Atlantic

- Requests by Council for advice from the Scientific Committee
- Proposals for conservation and management
- Updates

4.2 Hooded Seals

Greenland Sea
Northwest Atlantic

- Requests by Council for advice from the Scientific Committee
- Proposals for conservation and management
- Updates

4.3 Ringed Seals

Greenland
Canada
Faroe Islands

- Requests by Council for advice from the Scientific Committee
- Proposals for conservation and management
- Updates

4.4 Grey Seals

Greenland
Norway
Faroe Islands
Iceland

- Requests by Council for advice from the Scientific Committee
- Proposals for conservation and management
- Updates

4.5 Harbour Seals

Greenland
Norway
Iceland

- Requests by Council for advice from the Scientific Committee
- Proposals for conservation and management
- Updates

4.6 Bearded seal

Greenland
Norway

- Proposals for conservation and management
- Updates

4.7 Walrus

Greenland

- Requests by Council for advice from the Scientific Committee
- Proposals for conservation and management
- Updates

5. PROCEDURES FOR DECISION-MAKING ON CONSERVATION AND MANAGEMENT MEASURES

6. TRADE ISSUES AND THE EU BAN OF IMPORT OF SEALSKIN[1]

7. ECOSYSTEM-BASED MANAGEMENT[2]

8. USER KNOWLEDGE IN MANAGEMENT DECISION-MAKING[3]

9. RELATED MANAGEMENT ISSUES[4]

9.1 Marine mammal - fisheries interactions[5]
9.2 Environmental questions
9.3 By-catch data and monitoring
9.4 Other topics

10. ANY OTHER BUSINESS

[1] Greenland and Norway will provide an update on the situation.
[2] Overlap with the Management Committee for Cetaceans, and could be discussed in a joint meeting of the two Management Committees if desired.
[3] Overlap with the Management Committee for Cetaceans, and could be discussed in a joint meeting of the two Management Committees if desired.
[4] These items have been placed separately from the individual species, because they overlap to varying extents with the work of other committees; items 9.1 – 9.3 incl. overlap with the Management Committee for Cetaceans, and could be discussed in a joint meeting of the two Management Committees if desired; item 9.2 is also listed on the Council agenda.
[5] This item also includes Economic aspects of marine mammal – fisheries interactions and Multi-species approaches to management.

Appendix 2 List of documents

Document no	Title	Agenda item
NAMMCO/23/SMC/1	List of Documents	
NAMMCO/23/SMC/2	Draft Agenda	2.
NAMMCO/23/MC/3	Status of Past Proposals for Conservation and Management	4., 7. and 9.
NAMMCO/23/MC/4	Summary of Requests by NAMMCO Council to the Scientific Committee, and Responses by the Scientific Committee	4.
NAMMCO/23/SMC/5	Recommendations to member countries 2014	4. and 9.
NAMMCO/23/5	Report of the Twenty First Meeting of the Scientific Committee	4., 5., 7., and 9.

ANNEX 1 List of proposals for conservation and management

This table provides a summary of all proposals for conservation and management made by the Management Committees, and the responses of member countries to these proposals as stated at later meetings. This document will be continually updated to serve as a resource for both the Council and the Management Committees. Codes beginning with: 1 – relevant to all Management Committees; 2 – relevant to seals; 3 – relevant to whales.

CODE	PROPOSAL FOR CONSERVATION AND MANAGEMENT	MANAGEMENT MEASURES/RESPONSE BY MEMBER COUNTRIES
1.1.0	**Incorporation of the users' knowledge in the deliberations of the Scientific Committee**	
1.1.1	The Management Committee endorsed the proposals and viewpoints contained in section 6 in the Scientific Committee report, and suggested that the "Draft Minke Whale Stock Status Report" (NAMMCO/9/7) could usefully serve as a pilot project for cooperation with the hunters. (NAMMCO/9).	Status Reports under development.
1.1.2	The Management Committee had previously asked the Secretariat to proceed with a proposal by the Scientific Committee to use stock status reports as a starting point for discussions with resource users to incorporate their knowledge in advice to Council, and to use the stock status report on minke whales as a pilot project. However, in 2000 the Management Committee recommended that a proposal for a conference on incorporating user knowledge and scientific knowledge into management advice should proceed, and asked the Conference Advisory Group to plan this conference to evaluate whether and how the previous proposal for incorporating user knowledge into the Scientific Committee's deliberations could be incorporated into the Conference (NAMMCO/11).	Greenland informed the Committee that a person had been hired at the Greenland Institute of Natural Resources to deal with these issues, and that this employee is also on the Advisory Board of the Conference. (NAMMCO/11)
1.1.3	The Management Committee re-established the Working Group on User Knowledge in Management and provided new Terms of Reference for the Group (NAMMCO/15). However, in 2006 the Committee had not met and no progress has been made. The Management Committee reaffirmed the importance of this issue, and considered that the process might be facilitated by focussing on a few key species at first. The Management Committee therefore **recommended** that the Working Group focus narwhal and beluga in the near term. It was also noted that this Working Group will report to the Council henceforth (NAMMCO/16).	

CODE	PROPOSAL FOR CONSERVATION AND MANAGEMENT	MANAGEMENT MEASURES/RESPONSE BY MEMBER COUNTRIES
	The Management Committee agreed that the issue of user knowledge in management decision-making, while also being a general item on the Council agenda, should be included on future agendas of the Committee to allow for the presentation of relevant new information from member countries and discussion in relation to the management of specific species and stocks. Council agreed to this recommendation from the MC and as a result agreed to dispense with the associated Working Group, noting that any further dedicated treatment of this issue would be decided in relation to deliberations in the respective MC's at future meetings (NAMMCO 17).	
1.2.0	**Marine mammal – fisheries interactions**	
1.2.1	The Management Committee noted (NAMMCO/16) the long-standing requests to the Scientific Committee in this area, and the conclusion of the Scientific Committee that no further progress was likely unless more resources were dedicated to modelling efforts already begun in Iceland and Norway, and to gathering the data necessary as model input previously identified by the Scientific Committee. In this respect it was noted that the Icelandic Research Program, which will provide required data on the feeding ecology of minke whales, will be completed by 2007. The Management Committee therefore agreed to recommend that the Scientific Committee review the results of the Icelandic program on the feeding ecology of minke whales and multispecies modelling as soon as these become available (NAMMCO/16). The Management Committees **expressed** a general support for the modelling exercise proposed and **recommended** the Secretariat and the Scientific Committee to continue the planning. The four modelling approaches proposed are: 1. Minimal realistic model implemented using GADGET 2. Ecopath with Ecosim 3. Time series regression 4. A simple biomass-based model such as one recently applied in eastern Canada. The exercise should be carried out preferably for two areas. Likely candidates include the Barents Sea and the region around Iceland. The projected investigation would require a funded multi-year project. Once funding is obtained, selection of appropriate area(s) should, if necessary, be decided by a working group of experts knowledgeable in the data requirements and availability.	

CODE	PROPOSAL FOR CONSERVATION AND MANAGEMENT	MANAGEMENT MEASURES/RESPONSE BY MEMBER COUNTRIES
	The tentative schedule provided for the work was articulated around 4 key-step meetings with a 2-year period as a realistic time-span for the whole process (NAMMCO/18).	
1.3.0	**By-catch**	
1.3.1	***Norway*:** The Management Committee supported the recommendation of the Working Group on by-catch that Norway provide the report of the March 2007 evaluation meeting to the NAMMCO Scientific Committee at their next meeting, and provide estimates of by-catch from fisheries to NAMMCO as soon as they become available (NAMMCO/16). *Faroes:* The WG supported the Faroes plan of conducting a questionnaire of fishermen to gather information about the magnitude of marine mammal by-catch as a useful first step (NAMMCO/16). *Iceland:* The Management Committee supported the advice of Working Group on by-catch that recommendations for improving the Icelandic monitoring program be accepted and implemented by Iceland in a timely fashion (NAMMCO/16). The Management Committee agreed in 2007 that the design of monitoring programs that will provide accurate and precise estimates of by-catch is in the main a scientific issue, and that such advice could therefore be provided by the Scientific Committee. The Management Committee agreed therefore to disband the standing Working Group on By-catch, as its role would now be fulfilled by the Scientific Committee (NAMMCO/16). The Management Committee agreed to the need for further guidance from Council in relation to priority of requests and workload of the Scientific Committee, before endorsing a review of by-catch systems (NAMMCO/17). The Management Committees **noted** the work undertaken by the Scientific Committee for organising a joint workshop with ICES, focussing on by-catch monitoring systems and	Norway reported that it has a reference fleet as a trial for by-catch reporting. It is hoped that data will be available and analysed at the end of 2009. The findings should be available for reporting next year (NAMMCO 18). Efforts are being made to include mandatory reporting of marine mammal by-catch in all fishing vessel logbooks in the Faroe Islands. It should be noted that logbooks are already mandatory on all vessels over 15 tonnes (NAMMCO 18). In Iceland there had been progress in monitoring but no results as yet (NAMMCO 18). There was still uncertainty whether by-catch in Greenland was reported as such or as catch (NAMMCO 18). Iceland reported new information on by-catch monitoring from 2009 (porpoise, harbour seal, bearded seal, grey seal and harp seal). Efforts are ongoing to improve reporting systems (NAMMCO 19). The Faroe Islands reported that a new electronic logbook system for vessels larger than 15 BRT is being developed and should be

CODE	PROPOSAL FOR CONSERVATION AND MANAGEMENT	MANAGEMENT MEASURES/RESPONSE BY MEMBER COUNTRIES
	reviewing the advantages and disadvantages of existing observation schemes for marine mammals, and **recommended** moving forward on this matter (NAMMCO 18). A Workshop on By-Catch Monitoring of marine mammals and seabirds, co-convened by NAMMCO and ICES was held successfully in Copenhagen in July 2010, and guidelines for best practices in monitoring by-catch are being developed and will be published (NAMMCO 19).	implemented in 2011 when reporting of marine mammal by-catch will become mandatory. (Conventional logbooks are already mandatory on vessels larger than 15 BRT.) (NAMMCO 19). Greenland reported that by-catches are reported as catches but a revised reporting system allowing discrimination of origin is underway (NAMMCO 19).
1.4.0	**Joint NAMMCO control scheme**	
1.4.1	The Management Committee agreed that the provisions of the Scheme should be amended to integrate requirements for observer training to ensure observer safety onboard vessels, and to take account of recent technological developments in automated monitoring. In addition the provisions should be modified to support it reporting to the Council rather than the Management Committee. (NAMMCO/16).	The revision of the provisions were finalised and adopted at NAMMCO 18.
1.5.0	**Enhancing ecosystem-based management**	
1.5.1	The Management Committee recommended that the Working Group on Enhancing ecosystem-based management meet in 2007, and noted that it will be reporting to the Council henceforth. Nevertheless this item is of course of interest in a management context, and will remain on the agenda of the Management Committees. (NAMMCO/16). Noting the conclusion of the Scientific Committee that no further progress was likely in this area unless more resources were dedicated to modelling efforts already begun in Iceland and Norway, and to gathering the data necessary as model input, the Management Committee recommended that these activities be a priority for member countries (NAMMCO/16). Development of ecosystem models for use in management is a time-consuming process,. However enough progress has been made recently to warrant new consideration and a broader terms of reference in the Scientific Committee Working Group on marine mammal-fisheries interactions. Council therefore decided to discontinue the *ad hoc* Working Group on ecosystem-based management. Discussions of a general nature on the management level in recent years had been useful, and the efforts of the members of the *ad hoc* Working Group were appreciated. However, the continued scientific and management focus on these issues was more appropriate for detailed discussion in the respective Management Committees. It was however also agreed to keep this item on the Council agenda as an opportunity to follow developments in more	

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	general terms and to review how other relevant international bodies are addressing both the concepts and the practicalities of ecosystem-based management (NAMMCO 17).	
2.1.0	**Harp seals**	
2.1.1	The Management Committee requests that the Scientific Committee annually discusses the scientific information available on harp and hooded seals and advice on catch quotas for these species given by the ICES/NAFO Working Group on Harp and Hooded Seals. The advice by the Scientific Committee on catch quotas should not only be given as advice on replacement yields, but also levels of harvest that would be helpful in light of ecosystem management requirements For the Barents/White Sea and Greenland Sea stocks, in addition to the advice on replacement yields, advice should be provided on the levels of harvest that would result in varying degrees of stock reduction over a 10 year period (NAMMCO/13).	Greenland informed that a new executive order on seals will come into force in 2010 (NAMMCO 18).
2.1.2	*Northwest Atlantic* The Management Committee noted that a new abundance estimate for Northwest Atlantic harps seals of 4.8 million was available, based on a pup production estimate for 1994 of 702,900. The Management Committee also noted the conclusion that the Northwest Atlantic population of harp seals has been growing at a rate of 5% per year since 1990, and that the 1996 population was estimated to be 5.1 million, with a calculated replacement yield of 287,000. The Management Committee concluded that catch levels of harp seals in Greenland and Canada from 1990 to 1995 were well below the calculated replacement yields in this period (NAMMCO/6). The Management Committee noted that combined estimated catches of harp seals in Canada and Greenland are in the order of 300,000 and that these catches are near, or at, the established replacement yields (NAMMCO/8*).* Noting that Canada has instituted a multi-year management plan with a 3- year allowable catch of harp seals totalling 975,000 (not including the catch by Greenland), the Management	Canada brought to the attention of the Committee the recently completed Report of the Eminent Panel on Seal Management, which contains a full review of research and management of seals in Canada, with a primary focus on Northwest Atlantic harp and hooded seals. The Report is available at the following web site: http://www.dfo-mpo.gc.ca/seal-phoque/reports/index.htm. Canada also noted that an abundance survey of the Northwest Atlantic harp seals had been completed in 1999, and that published results were now available. (NAMMCO/11). Greenland commented that sustainable catches may be obtained at other catch levels than those that provide replacement yields. (NAMMCO/11). The Observer for Canada presented information on a multi-year management plan for the Atlantic seal hunt, which was announced in February 2003. For harp seals total allowable catch is set at 975,000 over a 3-year period. If the full quota were taken and Greenlandic harvests were as forecast, the total take should result in a slight population reduction over the period, while still maintaining the

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	Committee requested the Scientific Committee to provide advice on the likely impact on stock size, age composition, and catches in West Greenland and Canada under the conditions of this plan (NAMMCO/13). The Management Committee noted that the request from advice from NAMMCO/14 "Evaluate how a projected decrease in the total population of Northwest Atlantic harp seals might affect the proportion of animals summering in Greenland" was still open. The SC gave partial answer and had recommended again the request to be addressed to the ICES-NAFO WG. The Management Committee recommended that Greenland take the initiative of forwarding this request to ICES. (NAMMCO/16).	population well above the conservation reference points adopted (NAMMCO/12). Greenland informed the Management Committee that bilateral discussions with Canada on the Canadian Management Plan had taken place over the past year (NAMMCO/13). Greenland noted that there had still been no bilateral consultations with Canada on management of this stock, which is shared between the two countries. The Observer for Canada informed the Committee that a new multi-year management plan is in preparation, and that consultations with Greenland would be arranged in the near future (NAMMCO/15).
2.1.3	*North Atlantic, White/Barents Sea* The Management Committee noted the stock status and catch options presented by the Scientific Committee, and concluded that the catch level in 1998 was well below the calculated replacement yield. Catches at the same level in the future may result in population increase. From a resource management point of view, future quota levels approaching the replacement yield are advised. (NAMMCO/9).	Norway informed the Committee that measures were being considered to improve the efficiency of the seal harvest in this area. The possibility of introducing smaller vessels into the seal hunt is being pursued. The long-term goal will be to reduce the need for subsidising the hunt and increase the take of seals from this stock (NAMMCO/13, NAMMCO/14, NAMMCO/15).
2.1.4	*Greenland Sea* The Management Committee noted the stock status and catch options presented by the Scientific Committee, and concluded that the catch level in 1998 was well below the calculated replacement yield. Catches at the same level in the future may result in population increase. From a resource management point of view, future quota levels approaching the replacement yield are advised. (NAMMCO/6).	Norway informed the Committee that, similar to the situation for the White/Barents Sea stock, efforts are being made to improve the efficiency of harvesting. Recent harvests have been a small fraction of available quotas. Again the long-term goal will be to reduce the need for subsidising the hunt and increase the take of seals from this stock (NAMMCO/13). Norway reported that quotas for this stock have been roughly doubled since 2005, based on advice from NAMMCO and ICES. However at present there is insufficient capacity to take higher quotas, so catches are expected to be much lower than the quotas (NAMMCO/15).
2.1.5	The Management Committee noted the conclusion of the Scientific Committee that the framework for the management of these species proposed by the ICES/NAFO Working Group would not be useful for NAMMCO for technical reasons and because the management objectives inherent in the framework were inflexible. In the case of harp and	

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	hooded seals, where management goals may in the future be defined in relation to ecosystem based objectives, more flexibility will be required than is allowed in this framework (NAMMCO/15). As suggested by the Scientific Committee in 2004, the Management Committee recommended that NAMMCO explore the possibility with ICES and NAFO of assuming a formal joint role in the Working Group on Harp and Hooded Seals. The Secretariat should contact ICES and NAFO in this regard. As a starting point, the Working Group, jointly with the NAMMCO Scientific Committee, should be asked to provide advice on outstanding requests (see NAMMCO Annual Report 2004, p. 27) (NAMMCO/15).	
2.1.6	The Management Committee also **endorsed** the WGHARP recommendation to implement the four-tiered management strategy which aligns with the Norwegian management strategy for Greenland Sea harp seals, once the population becomes data rich NAMMCO 18).	
2.2.0	**Hooded seals**	
2.2.1	*Northwest Atlantic* Noting the Scientific Committee's review of available analyses of hooded seal pup production, which recognised that calculations are dependent on the particular rate of pup mortality used, as well as the harvest regimes, the Management Committee concluded that present catches of hooded seals in the Northwest Atlantic (1990-1995) were below the estimated replacement yields of 22,900 calculated for a harvest of pups only, and 11,800 calculated for a harvest of 1-year and older animals only (NAMMCO/6).	
2.2.2	*Northwest Atlantic* The Management Committee noted that the total catch of hooded seals in the Northwest Atlantic in 1996 slightly exceeded the replacement yield while in 1997 the total number of seals taken was much lower (NAMMCO/8).	Greenland noted that this stock was shared with Canada and that the two countries hold regular bilateral discussions on management of this stock, including an exchange of information on harvest statistics, utilisation and stock assessment. (NAMMCO/11).
2.2.3	*Greenland Sea* The Management Committee noted the stock status and catch options presented by the Scientific Committee, and concluded that the catch level in 1998 was well below the calculated replacement yield. Catches at the same level in the future may result in population increase. From a resource management point of view, future quota levels approaching the	While supporting that catch levels for this stock are below replacement yield, Norway noted that the abundance estimate for this stock is dated and that it hoped that new information should soon be available from surveys planned for 2002. (NAMMCO/11).

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	replacement yield are advised (NAMMCO/9).	Norway informed the Committee that quotas in this area have been reduced on the advice of the ICES/NAFO Working Group on Harp and Hooded Seals, mainly because there is no recent abundance estimate for the stock. Consequently it is expected that the quota may be fully utilised this year (NAMMCO/13). Norway informed the Committee that a hooded seal survey covering all stocks will be carried out jointly with Canada and Greenland in 2005 (NAMMCO/14). A survey covering all stocks was carried out in 2005. Norway reported that, based on preliminary results from these surveys, quotas have been reduced for the Greenland Sea stock. A new survey will be carried out in the near future. Greenland noted that it had given Norway permission to take seals within the Greenland EEZ in 2006 (NAMMCO/15).
2.3.0	**Ringed seals**	
2.3.1	The Management Committee noted the conclusions of the Scientific Committee on the assessment of ringed seals in the North Atlantic, which had been carried out through the Scientific Committee Working Group on Ringed Seals. In particular, the Management Committee noted that three geographical areas had been identified for assessing the status of ringed seals, and that abundance estimates were only available for Area 1 (defined by Baffin Bay, Davis Strait, eastern Hudson Strait, Labrador Sea, Lancaster, Jones and Smith sounds (NAMMCO/6).	
2.3.2	While recognising the necessity for further monitoring of ringed seal removals in Area 1, the Management Committee endorsed the Scientific Committee's conclusions that present removals of ringed seals in Area 1 can be considered sustainable (NAMMCO/6).	Greenland: the government is presently undertaking a regulatory initiative which will deal with hunting of all seals in Greenland, rather than just harbour seals as at present (NAMMCO/11).
2.4.0	**Grey seals**	
2.4.1	The Management Committee noted the concern expressed by the Scientific Committee with regard to the observed decline in the grey seal stock around Iceland, where harvesting has been above sustainable levels for more than 10 years, with the apparent objective of reducing the size of the stock. The Management Committee agreed to recommend that Iceland should define clear management objectives for this stock.	Iceland: the management objective for grey seals would be to maintain the stock size close to the current level, and that protective measures would be taken should further declines continue. A precondition is careful monitoring of the stock size.

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	The Management Committee noted the conclusion of the Scientific Committee that the new quota levels implemented for Norwegian grey seals would, if filled, almost certainly lead to a rapid reduction in population in the area. The Management Committee agreed to recommend that Norway should define clear management objectives for this stock. For the Faroe Islands, the Management Committee supported the recommendation of the Scientific Committee to obtain better information on the level of catch (NAMMCO/13). The Management Committee recommended Greenland to protect grey seals from hunting given the likely isolation of the small stock in southeast Greenland (NAMMCO 19).	Norway: a management plan for grey seals is presently under development. Recent catches have been lower than the quota levels in most areas (NAMMCO/14). Norway: a management plan for grey seals is still under development. In response to a query from Greenland, Norway informed the Committee that grey seals are not managed in cooperation with other jurisdictions as there is believed to be little exchange among stocks (NAMMCO/15). The Faroes: a drastic decline in salmon aquaculture had likely led to a decline in killing of grey seals that were a nuisance to the industry (NAMMCO/15). The Faroes: there would be a satellite tracking programme for grey seals starting in the spring of 2007 to aid further studies on feeding ecology and abundance. (NAMMCO/16). Norway: a quota of 25% of the population has been established taking into consideration the estimated by-catch levels. A new population estimate for the period 2006-8 will soon be available, and a management plan, complemented by a genetic study, will be presented to the next Scientific Committee meeting in 2009 (NAMMCO 17). Norway: national management plans are presently ready to be fully implemented for both grey and harbour seals (NAMMCO 19). Norway: management plans for both grey and harbour seals have been implemented in Norway since late autumn 2010 (NAMMCO 20). Greenland: the recommendation of a total ban on hunting of grey seals has already been incorporated in a new Executive Order from 1st December 2010 (NAMMCO 19 and 20).

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2.4.2	With regards to the present estimate of a harvest up til 40% of the population annually, the Scientific Committee **urged** the Faroe Islands to estimate their present removals and abundance off their coast. The Scientific Committee **strongly recommended** that all efforts be made in providing a proper estimate of population size and catch at its next meeting (NAMMCO 18). The Scientific Committee also **recommended** that the Faroe Islands define clear management objectives for grey seals, and that the reporting of grey seal catches in the Faroe Islands be made mandatory and enforced (NAMMCO 18). The Management Committee for Seals and Walruses **recommended** the convening of a WG on Coastal Seals to review the Norwegian Management plan in view of an assessment. The Management Committee for Seals and Walruses also **supported** the recommendations concerning the compilation and reporting of Faroese removal and abundance data, and the Icelandic research data (NAMMCO 18). The Management Committee urged the Faroe Islands to estimate removals and abundance of grey seals around their coast, and to provide proper estimates of population size snd catches for 2011 (NAMMCO 19).	The Faroese: efforts were underway to obtain better information on population, removals and breeding sites for this species, and satellite tagging of grey seals is in progress. Private companies possess data on this and other species Iceland: the management objective is to maintain the grey seal stock at the 2004 level of 4,100 animals. The latest estimate is 6,200 animals and well above the management objective (NAMMCO 19).
2.5.0	**Harbour seals**	
2.5.1	The Committee noted a request from NAMMCO 16: to define management objectives for harbour seals in Norway, Iceland and Greenland (NAMMCO 17). A total ban on hunting for this species in Greenland is **recommended**, and a formal assessment of the stocks in all areas and the establishment of clear management objectives should be undertaken (NAMMCO 18). The Management Committee **reiterated a recommendation** for a formal assessment of the Icelandic stock and the establishment of clear management objectives (NAMMCO 18). Concerning the new Norwegian Management plan, the Management Committee **recommended**, as for the grey seal management plan, that a better way of taking uncertainties into consideration be developed and that an expert working group make an in	Norway: currently working on a management plan for harbour seals (NAMMCO/16). The Faroe Islands: no priority for a specific management plan at this time because the species no longer occurs in the Faroes (NAMMCO/16). Greenland: working on management plans for a number of species, including harbour seal. The next priority will be given to harbour seals. Reported catches have been very high, probably due to misreporting. With new catch reporting system 24 animals were reported for 2006 (NAMMCO/16). Iceland: new abundance estimates available, but still insufficient information on by-catch.

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	depth evaluation of the plan, including a comparison with existing management models for e.g. harp and hooded seals (NAMMCO 18).	Norway: implemented a system for assessment of the two coastal seal species that secures updated information about abundance approximately every 5 yr. This system has provided two abundance estimates after 1996. As a third point estimate is needed for an assessment for harbour seals another survey is needed and will probably be performed by 2010 (NAMMCO 17). Greenland: a new executive order on protection and hunting of seals in Greenland is under construction and in this a ban on hunting of harbour seal is included (NAMMCO 17). Iceland: management objectives for harbour seals had been set to maintain the stock close to the 2006 level (NAMMCO 19). Norway: national management plans are presently ready to be fully implemented for both grey and harbor seals (NAMMCO 19). These were implemented in late fall 2010 (NAMMCO/20).
2.6.0	**Atlantic walruses**	
2.6.1	The Management Committee examined the advice of the Scientific Committee on Atlantic Walrus and noted the apparent decline which the Scientific Committee identified in respect to "functional" stocks of walrus of Central West Greenland and Baffin Bay. While recognising the over all priority of further work to clarify and confirm the delineation and abundance of walrus stocks in the North Atlantic area, the Management Committee recommends that Greenland take appropriate steps to arrest the decline of walrus along its west coast. Taking into account the views of the Scientific Committee that the Baffin Bay walrus stock is jointly shared with Canada and that the West Greenland stock might be shared, the Management Committee encourages Canada to consider working co-operatively with Greenland to assist in the achievement of these objectives (*NAMMCO Annual Report 1995*: 49).	Greenland: new (1999) legislation for the conservation of the West Greenland stock include among other things restriction of who can hunt, a year-round ban on walrus hunting south of 66° N; and limitations on transport used in connection with walrus hunting to dog sleds and vessels of 19.99 GRT/31.99 GT or less. Municipal authorities now also have the possibility of implementing further restrictions if circumstances require. (NAMMCO/8). Greenland : a new regulatory proposal has been drafted introducing quotas on walrus. The final proposal will take public hearings into account. (NAMMCO/11). The regulatory initiative to introduce quotas and other hunting regulations for this species had been delayed, and comprehensive public hearings have been conducted. It is

CODE	PROPOSAL FOR CONSERVATION AND MANAGEMENT	MANAGEMENT MEASURES/RESPONSE BY MEMBER COUNTRIES
		expected that a final decision on the initiative will be taken later in 2003 (NAMMCO/12). Greenland: the new regulation will go to the Greenlandic government for approval this year (NAMMCO/13). Greenland: the new regulation is awaiting the findings of the Scientific Committee in their assessment of walrus. (NAMMCO/14). Greenland: the regulatory initiative had been delayed but was expected to be introduced in 2006 (NAMMCO/15).
2.7.2	The Management Committee noted that there was an ongoing request for advice for an assessment of this stock. Present removals were likely not sustainable for the North Water and West Greenland stocks, and it was recommended that new assessments for these stocks be completed as soon as identified research recommendations were fulfilled (survey reanalysis, new surveys, stock structure, and complete corrected catch series) (NAMMCO/16). The Management Committee agreed that the relationship between JCNB and NAMMCO regarding walrus would be revisited next year. (NAMMCO/16). The Management Committee agreed that total removals for all areas should be set under consideration of a probability of sustainability that is higher than or equal to 70% (NAMMCO 19). The Management Committee also agreed that managers should consider establishing a more robust system for monitoring the sex and age composition of the catch. Furthermore it was agreed that a common management regime should be established between Greenland and Canada on shared stocks of walruses (NAMMCO 19).	Greenland: considerable progress in this area of assessment through implementation of hunting regulations and the Greenland Institute for Natural Resources (GINR) developing a Research Plan for 2007-10 (NAMMCO/16). Greenland: new Executive Order, finalised in 2006. 3-year quotas for the period 2007 – 2009 were introduced designed to allow for a gradual reduction of catches that by 2009 will result in removals that will be within the sustainable levels recommended by the Greenland Institute of Natural Resources (NAMMCO/16). Greenland: want to manage the species in NAMMCO, hence no initiative has been taken towards Canada to cooperate on management of walrus. Under the JCNB only exchange of information takes place (NAMMCO 22).
2.8.0	**Bearded seal**	
	The Management Committee **recommended** that the status of this species be assessed (NAMMCO 18).	
3.1.0	**North Atlantic fin whales**	
3.1.1	*East Greenland-Iceland Stock* The Management Committee accepted that for fin whales in the East Greenland – Iceland (EGI) stock area, removals of 200 animals per year would be unlikely to bring the population down below 70% of its pre-exploitation level in the next 10 years, even under the least optimistic scenarios. However, catches at this level should be spread throughout the EGI stock area, roughly in proportion to the abundance of fin whales observed in the NASS	

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	surveys. Furthermore, the utilization of this stock should be followed by regular monitoring of the trend in the stock size. The conservative nature of the advice from the Scientific Committee was noted (NAMMCO/9).	
3.1.2	*East Greenland-Iceland Stock* The Management Committee noted the conclusion of the Scientific Committee that projections under constant catch levels suggest that the inshore substock will maintain its present abundance (which is above MSY level) under an annual catch of about 150 whales. It is important to note that this result is based upon the assumption that catches are confined to the "inshore" substock, *i.e.* to the grounds from which fin whales have been taken traditionally. If catches were spread more widely, so that the "offshore" substock was also harvested, the level of overall sustainable annual catch possible would be higher than 150 whales. (NAMMCO/13). The Management Committee noted the conclusion of the Scientific Committee that there was no reason to change their previous conclusion that a catch of 150 whales from the West Iceland sub-stock would be sustainable, and considered that this should conclude the SC's work on the EGI stock until new information becomes available (NAMMCO/16). It endorsed the plan to complete an assessment for the Northeast Atlantic stocks as a next step in the process of assessing the fin whale stocks in the areas of interest to NAMMCO countries (NAMMCO/16). The Management Committee noted the assessment performed by the SC and concluded that an annual strike of up to 154 fin whales from the WI Sub area is sustainable at least for the immediate 5 year period. (NAMMCO/19).	
3.1.3	*Faroe Islands* The Management Committee noted that the conclusion of the Scientific Committee had not changed from the previous assessment, that the uncertainties about stock identity are so great as to preclude carrying out a reliable assessment of the status of fin whales in Faroese waters, and thus the Scientific Committee was not in a position to provide advice on the effects of various catches. It may also be necessary to obtain clearer guidance on the management objectives for harvesting from what is likely to be a recovering stock before specific advice can be given (NAMMCO/13).	

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3.2.0	**Minke Whales - Central North Atlantic**	
3.2.1	The Management Committee accepted that for the Central Stock Area the minke whales are close to their carrying capacity and that removals and catches of 292 animals per year (corresponding to a mean of the catches between 1980-1984) are sustainable. The Management Committee noted the conservative nature of the advice from the Scientific Committee (NAMMCO/8).	
3.2.2	The Management Committee took note of the conclusions of the Scientific Committee with regard to the Central Atlantic Stock, that, under all scenarios considered, a catch of 200 minke whales per year would maintain the mature component of the population above 80% of its pre-exploitation level over that period. Similarly, a catch of 400 per year would maintain the population above 70% of this level. This constitutes precautionary advice, as these results hold even for the most pessimistic combination of the lowest MSYR and current abundance, and the highest extent of past catches considered plausible. The advice applies to either the CIC Small Area (coastal Iceland), or to the Central Stock as a whole (NAMMCO/13). Noting that a full assessment, including the 2009 estimate, will be conducted at the next meeting of the Large Whale Assessment WG in January 2010, the Management Committee for Cetaceans recommends that 200 minke whales per year be considered as the largest short-term catch that should be contemplated over the short-term, 2-5 years. This catch level refers to total removals from the CIC or CMA, both Icelandic and others (NAMMCO 18). The Management Committee agreed that annual removals of 216 minke whales from the CIC area are sustainable and precautionary and that annual removals of 121 minke whales from the CM area are sustainable and precautionary. Furthermore it was agreed that this management advice should apply for the next 5 years unless the Scientific Committee considers that new scientific evidence is likely to change the basis of the advice (NAMMCO 19). The Council took note of the Endorsement by the Management Committee for Cetaceans that annual removals of up to 229 minke whales from the CIC area are safe and precautionary for the next 5 years (NAMMCO 20).	

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	Minke Whales - West Greenland	
3.2.3		Greenland reported that a quota of 178 minke whales in West Greenland had been implemented from 2010 in response to the advice of the Scientific Committee of the IWC (NAMMCO 19).
3.3.0	**Narwhal - West Greenland**	
3.3.1	*Avanersuaq* The Management Committee noted that the present exploitation level in Avanersuaq of 150/yr seems to be sustainable, assuming that the same whales are not harvested in other areas. *Melville Bay – Upernavik* The Management Committee noted that the Scientific Committee could give no status for the Melville Bay – Upernavik summering stock. *Uummannaq* The Management Committee noted that the substantial catches (several hundreds) in some years do cause concern for the status of this aggregation. The Management Committee further noted that the abundance of narwhal in this area should be estimated. *Disko Bay* The Management Committee noted that present catches in this area are probably sustainable. *Catch Statistics* The Management Committee noted that for both narwhal and beluga it is mandatory for future management that more reliable catch statistics (including loss rates) are collected from Canada and Greenland (NAMMCO/9).	Greenland: harvest quotas will be introduced for West Greenland narwhal in the near future (NAMMCO/11). Greenland: the regulatory initiative to introduce quotas and other hunting regulations for this species had been delayed, and comprehensive public hearings have been conducted. The draft regulations have now been submitted to the Council of Hunters. It is expected that a final decision on the initiative will be taken later in 2003 (NAMMCO/12).
3.3.2	The Management Committee accepted that the JCNB would provide management advice for this stock, which is shared by Canada and Greenland. The Management Committee therefore recommended that closer links be developed with the JCNB on this and other issues of mutual concern. (NAMMCO/10).	Greenland: the new regulations pertaining to beluga will also apply to narwhal, and that quotas will be introduced in July 2004 (NAMMCO/13).
3.3.3	The Management Committee noted the conclusions of the Scientific Committee, that the West Greenland narwhal have been depleted, and that a substantial reduction in harvest levels	Greenland: quotas of 200 in West Greenland and 100 in Qaanaaq had been introduced in 2004, and the catch was lower than the quota level

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	will be required to reverse the declining trend. These are preliminary conclusions, and more research and assessment work will be required. Nevertheless the Management Committee expressed its grave concern over the status of the West Greenland narwhal, and noted that the JCNB, which provides management advice for this stock, would be considering this information in the near future. The Management Committee also noted that it will be important for NAMMCO to monitor the situation closely and update the assessment as soon as more information is available (NAMMCO/13).	(NAMMCO/14). Greenland: the quota for 1 July 2004 to 30 June 2005 of 300 had been nearly fully taken. The quota for 2005/2006 of 260 raised to 310 during the hunting season, mainly because hunter observations suggested that narwhal numbers were larger than expected and because the original quota levels were exceeded (NAMMCO/15).
3.3.4	In 2005 the Scientific Committee provided similar advice to that given in 2004, that the total removal of narwhals in West Greenland should be reduced to no more than 135 individuals. This advice was provided with even greater emphasis due to the fact that all models reviewed suggested total annual removals even lower than this. This conclusion was reached in a joint meeting with the JCNB Scientific Working Group, using the best scientific advice available. It is apparent that there continues to be considerable disagreement between scientists and hunters on narwhal stock structure, life history, and especially abundance and trends. While recognising the existence of this disagreement, the Management Committee concluded that it is nevertheless necessary to manage narwhals in a precautionary manner in the face of uncertainty and apparently contradictory evidence. In this regard it was noted that the 2004/2005 quota was 300 and that the quota for 2005/2006 of 260 was raised to 310. These quotas are more than two times the level recommended by the Scientific Committee. While commending Greenland for the recent introduction of quotas and reduction in the harvest, the Management Committee expressed serious concern that present takes of narwhal in West Greenland, according to the advice of both the NAMMCO Scientific Committee and the JCNB Scientific Working Group, are not sustainable and will lead to further depletion of the stock. In 2000 NAMMCO accepted that the Canada/Greenland Joint Commission on Conservation and Management of Narwhal and Beluga (JCNB) would provide management advice for this stock. The Management Committee therefore strongly urged the JCNB and the Government of Greenland to take action to bring the removals of narwhals in West Greenland to sustainable levels (NAMMCO/15).	

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	In 2007, Norway, Iceland and the Faroes shared the concern expressed by the Scientific Committee, that the narwhal quota for West Greenland remained well above the recommended level of 135 and that the quota had increased since it was introduced in 2004. It was also noted in this respect that the JCNB in 2006 had expressed grave concern at the status of this stock, and recommended the development of a work plan with a time frame for the reduction in total removals of narwhal to the recommended level (NAMMCO/16). The Management Committee welcomed the development of a monitoring plan but reiterated the serious concern expressed in previous years that present takes of narwhal in West Greenland, according to the advice of both the NAMMCO Scientific Committee and the JCNB Scientific Working Group, are not sustainable and will lead to further depletion of the stock. While accepting that there remains considerable disagreement between scientists and hunters with regard to the status of the stocks, it was nevertheless considered advisable to manage in a precautionary manner in the face of such uncertainty. The Management Committee therefore once again strongly urged the JCNB and the Government of Greenland to take action to bring the removals of narwhals in West Greenland to sustainable levels as quickly as possible. (NAMMCO/16).	In 2007, the Minister of Fisheries for Greenland responded that decisions regarding catch limitations are taken with consideration of the views of scientists and hunters, and that in this case the two groups have a very different perception of the status of the stock. Narwhal are seasonally abundant in some areas and it has proven difficult up to now to reach a consensus between scientists and hunters on stock status. Hunting is very important to the culture and economy of Greenland. The minister also stated that belugas and narwhals consume Greenland halibut and disturb the fisheries. Jessen added that, in order to avoid inflicting undue hardship on hunting families, Greenland has opted for a gradual reduction of quotas, with the aim of reaching recommended sustainable levels. Greenland has also developed a monitoring and survey plan to obtain better information on the status of beluga, narwhal and walrus, for which funding is being sought. In addition Greenland is developing a multi-year management plan for narwhal (NAMMCO/16).

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3.3.5	The Management Committee for Cetaceans **noted** that the quotas given for the period July 2008 - June 2009 of 260 narwhals in West Greenland (WG) and 130 narwhals in Melville Bay (MB), gave a lower probability of population increase than the 70% recommended for West Greenland narwhals (70% chance of increase corresponds to a total take of 229 and 81 narwhals in WG and MB) (NAMMCO 18). The Management Committee for Cetaceans, based on advice from the Scientific Committee, **recommended** that catches be set so that there is at least a 70% probability that management objectives will be met for West and East Greenland narwhals, i.e. maximum **total removals** of 310 and 85 narwhals in West and East Greenland respectively (NAMMCO 18). The Management Committee **noted** that NAMMCO is the competent body to advise on East Greenland, and that Greenland has followed the advice of the NAMMCO Scientific Committee, which is now endorsed. The Management Committee welcomed the fact that Greenland has followed the NAMMCO advice (NAMMCO 18).	Greenland stated that it will continue with its multi-year management plan for narwhals using 70% probability of increase – total 310 for W.Greenland and 85 narwhals for East Greenland. Greenland commented that collaboration between managers, hunters and scientists has improved (NAMMCO 18).
3.3.6	The Management Committee strongly **recommends** that "struck and lost" data be collected from all areas and types of hunt and that all "struck and lost" animals be included in the advice (NAMMCO 19).	
3.4.0	**Beluga - West Greenland**	
3.4.1	*Maniitsoq – Disko* The Management Committee noted that a series of surveys conducted since 1981 indicate a decline of more than 60% in abundance in the area Maniitsoq to Disko. It further noted that with the present harvest levels (estimated at 400/yr) the aggregation of belugas in this area is likely declining due to overexploitation. *Avanersuaq – Upernavik* The present harvest in the area Avanersuaq - Upernavik is estimated to be more than 100/yr. The Management Committee noted that since this beluga occurrence must be considered part of those wintering in the area from Maniitsoq to Disko, it is considered to be declining due to overexploitation. Finally the Management Committee noted that with the observed decline a reduction in harvesting in both areas seems necessary to halt or reverse the trend (NAMMCO/9).	Greenland: in November 2000 the government made a decision to introduce harvest quotas for beluga and narwhal. Public hearings on a draft regulatory proposal were held in spring 2001. The results of these hearings are being taken into account in the drafting of a revised regulatory proposal, and a final set of regulations is expected to be introduced sometime in 2002 (NAMMCO/11). Greenlan: the regulatory proposal had been delayed, and comprehensive public hearings have been conducted. The draft regulations have now been submitted to the Council of Hunters. It is expected that a final decision on the initiative will be taken later in 2003 (NAMMCO/12).

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3.4.2	It was accepted that the Canada/Greenland Joint Commission on Conservation and Management of Narwhal and Beluga (JCNB) would provide management advice for this stock, which is shared by Canada and Greenland. Closer links should be developed between NAMMCO and the JCNB on this and other issues of mutual concern. (NAMMCO/10).	
3.4.3	A joint meeting of the NAMMCO Scientific Working Group on the Population Status of North Atlantic Narwhal and Beluga and the JCNB Scientific Working Group had been held in May 2001. It was recommended that this co-operation at the scientific level should continue, and it was reiterated that closer links be developed between NAMMCO and the JCNB on this and other issues of mutual concern. (NAMMCO/11).	Greenland: a regulatory framework allowing the government to set quotas and other limitations on hunting has now been passed. It is expected that quotas will be introduced for beluga and narwhal by July 2004. (NAMMCO/13). Greenland: a quota of 320 had been introduced in West Greenland and Qaanaaq year-round from 1st July 2004. After implementation the catch was lower than the quota level, mainly due to poor weather conditions (NAMMCO/14). Greenland: the quota for 1 July 2004 to 30 June 2005 of 320 had not been fully harvested due mainly to poor weather conditions. The quota for 2005/2006 is 220 (NAMMCO/15).
3.4.4	The JCNB recommends reducing catches to 100 per year will have an 80% chance of halting the decline in beluga numbers by 2010. Similar advice was first provided in 2000 and has been confirmed and reiterated in meetings held in 2003 and 2004. Despite considerable disagreement between scientists and hunters on beluga, the Management Committee concluded that it is necessary to manage beluga in a precautionary manner in the face of uncertainty and apparently contradictory evidence. While commending Greenland for the recent improvements (quotas and reduction of harvest) serious concern was expressed that present quotas for beluga in West Greenland, are not sustainable and will lead to further reduction of the stock. The Management Committee therefore strongly urged the JCNB and Greenland to take action to bring the removal of belugas in West Greenland to sustainable levels (NAMMCO/15). The population is depleted and further action is needed to halt the decline. The quota is still above the recommended level of 100. However it was also noted that the quota has been	

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	reduced since its introduction in 2004. The Management Committee therefore commended Greenland for their management efforts to improve the conservation status of beluga in this area, and strongly urged Greenland to continue their efforts to bring the catch to sustainable levels. The Management Committee also welcomed the development of the monitoring plan mentioned above for narwhal which also applies to beluga (NAMMCO/16). The Management Committee for Cetaceans welcomed the multi-annual catch quotas recently introduced by Greenland for beluga stocks based on advice of the Scientific Committee that an annual take of 310 belugas over 5 years up to 2014 was sustainable, and **noted** that these are intended to rebuild the level of the stocks in coming years and therefore ensure the long-term sustainability of catches (NAMMCO 18).	
3.5.0	**Northern bottlenose whales**	
3.5.1	The Management Committee discussed the advice of the Scientific Committee on the status of the northern bottlenose whale and noted that this was the first conclusive analysis on which management of the northern bottlenose whale could be based. The Management Committee accepted that the population trajectories indicated that the traditional coastal drive hunt in the Faroe Islands did not have any noticeable effect on the stock and that removals of fewer than 300 whales a year were not likely to lead to a decline in the stock (NAMMCO/5).	
3.6.0	**Long-finned pilot whales**	
3.6.1	The Management Committee noted the findings and conclusions of the Scientific Committee with respect to the status of long-finned pilot whales in the North Atlantic (Section 3.1, item 3.1), which confirmed that the best available abundance estimate of pilot whales in the Central and Northeast Atlantic is 778,000. Also that there is more than one stock throughout the entire North Atlantic, while the two extreme hypotheses of i) a single stock across the entire North Atlantic stock, and ii) a discrete, localised stock restricted to Faroese waters, had been ruled out. It further noted that the effects of the drive hunt of pilot whales in the Faroe Islands have had a negligible effect on the population, and that an annual catch of 2,000 individuals in the eastern Atlantic corresponds to an exploitation rate of 0.26%. The conclusion is that the drive hunt of pilot whales in the Faroe Islands is sustainable (NAMMCO/7).	In 1997 the Management Committee concluded that the Faroese drive hunt of pilot whales is sustainable. There have been no changes in annual take, new abundance estimates or other information that warrant any change in this conclusion. (NAMMCO/11). The Faroe Islands: plans are underway to implement a monitoring programme, the aim of which is to update the existing comprehensive biological data on pilot whales that was provided by the dedicated international research programme in the Faroe Islands in 1986-1988 (NAMMCO 18).

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	There is a comprehensive international scientific research sampling of all pilot whales caught in the Faroes from 1986 to 1988, and the Management Committee recognised the value of building on and updating this valuable information by ensuring ongoing sampling of pilot whales in the Faroes (NAMMCO/16).	
3.7.0	**Humpback whales**	
3.7.1	In 2006 new abundance estimates for West Greenland were available from surveys conducted in 2005. The Management Committee accepted the conclusion of the Scientific Committee that a removal (including by-catch) of up to 10 animals per year in West Greenland would not harm the stock in the short or medium term. The Management Committee therefore proposed that Greenland limit annual removals of humpback whales, including by-caught and struck and lost whales, to 10 off West Greenland. (NAMMCO/16). The Management Committee **noted** that in 2008, the Scientific Committee reconsidered its interim advice from 2006 for West Greenland humpbacks on the basis of the estimate of the survey conducted in 2007, noting that the abundance estimate was higher than that of the 2005 survey, on which the 2006 interim advice was based. The Management Committee **recommended** that the total quota of humpbacks in West Greenland in 2009, including by-catches, should not exceed 10 animals (NAMMCO 17; NAMMCO 18). The Management Committee **recommended** that a total removal of up to 20 humpback whales per year 2010-2015 would be sustainable (NAMMCO/19).	
3.8.0	**Harbour porpoises**	
3.8.1	The Management Committee noted in 2007 there was not a sufficient information base to provide advice on sustainable removals for this species for any of the NAMMCO member countries. Noting this, the Management Committee recommended that member countries conduct surveys to produce reliable estimates of abundance for harbour porpoises in their areas. In addition the Management Committee recommended that member countries provide reliable estimates of total removals, including by-catch, for this species. Once this information is available for any area, the sustainability of removals can be assessed by the Scientific Committee. This was considered particularly urgent for Greenland, where directed	Iceland underlined that harbour porpoises were included in the 2007 survey and analyses will be presented to the next Scientific Committee meeting in 2009. This will provide the first reliable abundance estimate in the Icelandic coastal area.

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	catches are in the low thousands annually (NAMMCO/16). The Management Committee **endorsed** the Scientific Committee recommendations that Iceland and Greenland co-ordinate their analyses of the 2007 data with regard to this species, that any survey undertaken in the Faroe Islands should be designed to be compatible with the SCANS surveys, and that there should be adequate monitoring of by-catches in all areas. (NAMMCO/17)	Greenland informed the Management Committee that a new executive government order on small cetaceans is being prepared that will include harbour porpoises, pilot whales and dolphins. Norway reported that porpoise by-catch data will be available after validation of their by-catch monitoring programme (NAMMCO 17).
3.9.0	**T-NASS**	
3.9.1	While recognizing national priorities, the Management Committee recommended that NAMMCO countries make every effort possible to ensure the coordination of the survey in terms of timing and coverage (spatial contiguity). The Management Committee also recommended that member countries assist the Committee in obtaining additional funding to support the T-NASS Extension and Acoustic subprojects. (NAMMCO/16). The Management Committee endorsed the Scientific Committee's recommendations for the next survey would be within the 2013-2015 time frame, and that a working group for planning of future surveys be set up as soon as possible, along with negotiations with all potential partners, and a consideration of extending the survey areas (NAMMCO 19).	
4.0.0	**General Models**	
4.0.1	The Management Committee **endorsed** the Scientific Committee recommendation to use an "RMP implementation simulation process (IST)-like approach – as modified by Norway" as a general model for conservation and management of baleen whales in NAMMCO (NAMMCO 18).	

ANNEX 2 Summary of requests by Council to the Scientific Committee and responses

This table provides a summary of all active requests by the NAMMCO Council to the Scientific Committee, and notes the response of the Scientific Committee (SC) to these requests. This document will be continually updated to serve as a resource for both the Council and the Scientific Committee. Codes beginning with: 1 – relevant to all Management Committees; 2 – relevant to seals; 3 – relevant to whales.

Code	Meeting	Request	Response of the Scientific Committee	Status
1.1.0	**MARINE MAMMAL – FISHERIES INTERACTIONS:**			
1.1.5	NAMMCO/7 05-1997	The Council encourages scientific work that leads to a better understanding of interactions between marine mammals and commercially exploited marine resources, and requested the Scientific Committee to periodically review and update available knowledge in this field.	The SC recommends (this request) should remain as standing request and also takes the place of R-1.1.3 (SC21).	Standing
1.1.8	NAMMCO/17 09-2008	In addressing the standing requests on ecosystem modelling and marine mammal fisheries interaction, the SC is requested to extend the focus to include all areas under NAMMCO jurisdiction. In the light of the distributional shifts seen under T-NASS 2007, the SC should investigate dynamic changes in spatial distribution due to ecosystem changes and functional responses. See also 1.1.6 and 1.4.6.	The SC convened in 2009 the WG on Marine Mammal Fisheries Interaction (MMFI) because it judg ed at its last meeting that the developments in modelling and other progress which had occurred in Norway, Canada and Japan warranted their review. SC has reviewed progress made in all areas and for all species. (SC/16). This request should be kept as ongoing until the results expected from Iceland are presented in the SC (SC21).	Ongoing
1.2.0	**MULTISPECIES APPROACHES TO MANAGEMENT:**			
1.2.1	NAMMCO/1 1992	To consider whether multispecies models for management purposes can be established for the North Atlantic ecosystems and whether such models	The original NAMMCO project (coordinated by Lars Walløe) on modelling has developed into a much broader EU project incl. more general fisheries management considerations and a socioeconomic	Ongoing

Code	Meeting	Request	Response of the Scientific Committee	Status
		could include the marine mammals 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.	component. It is funded with 6 million Euros for the next 4 years, and includes 29 institutes from 16 countries. It still contains parts of the original marine mammal components, Iceland is still a core area, together with many other areas, however multispecies modelling in the Barents Sea has been removed. (SC/20)	
1.2.2	NAMMCO/5 02-1995	In relation to the importance of the further development of multispecies approaches to the management of marine resources, the Scientific Committee was requested to monitor stock levels and trends in stocks of all marine mammals in the North Atlantic.	It was clarified that the purpose of this request was to ensure that data on marine mammals was available for input into multi-species models for management. The Committee agreed that updated information on abundance and indications of trends in abundance of stocks of marine mammals in the North Atlantic should be clearly described in a new document for the internal reference of the Council, to replace the List of Priority Species. This document would be entitled Status of Marine Mammals in the North Atlantic and should include those cetacean and pinniped species already contained in the List of Priority Species, as well as other common cetacean species in the NAMMCO area for which distribution and abundance data is also available (fin, sei, humpback, blue, and sperm whales). (SC/5).	Standing
1.4.0	**ECONOMIC ASPECTS OF MARINE MAMMAL-FISHERIES INTERACTIONS:** No current requests.			
1.5.0	**ENVIRONMENTAL ISSUES:** No current requests.			
1.7.0	**MONITORING MARINE MAMMAL STOCK LEVELS AND TRENDS IN STOCKS /NORTH ATLANTIC SIGHTINGS SURVEYS (NASS)*:***			

Code	Meeting	Request	Response of the Scientific Committee	Status
1.7.11	NAMMCO/16 02-2007	Once the survey has been completed, the Committee requested the Scientific Committee to develop estimates of abundance and trends as soon as possible, with the primary target species (fin, minke and pilot whales) as a first priority, and secondary target species as a second priority.	This request is being addressed with the near completion of most of the analyses of T-NASS minke whale survey data. Abundance estimates for fin whales have been finalized (Icelandic-Faroese shipboard and Greenland aerial T-NASS surveys) or are on their way (Norway shipboard T-NASS survey). Some progress has been made in the analyses of pilot whale data, although further analyses are warranted, which will be presented to the next AE WG in October 2009. (SC/16). Estimates of abundance for some key species are available and referred to in the SC report (SC/17).	Ongoing
1.7.12	NAMMCO/22-2013	Greenland requests the SC to give information on sustainable yield based on new abundance estimates expected from TNASS2015 for all large baleen whales in West Greenland waters (NAMMCO 22).	The SC noted this new request, and will consider this again after T-NASS2015. (SC/21)	Ongoing
1.8.0	**OTHER:** No current requests			
2.1.0	**HARP AND HOODED SEALS**			
2.1.4	NAMMCO/12 03-2003	The Management Committee noted that new information recently had become available on the abundance of harp seals in the Greenland Sea and the Northwest Atlantic. In addition new information is available on movements and stock delineation of harp seals in the Greenland, Barents and White seas. The Management Committee therefore reiterated its previous request to the Scientific Committee to regularly update the stock status of North Atlantic harp and hooded seals as new information becomes available. The Management Committee noted the	SC endorsed the WGHARP 2008 meetings update of the stock status of North Atlantic hooded seals, and noted that this is a standing request that will be taken up again when new data become available. Since the population in the Greenland Sea in 2007 is still well below N_{lim}, and the results of the 2007 survey were similar to those in 2005, the SC reiterates its recommendation from SC 14 that catches in the Greenland Sea be restricted to necessary scientific catches and to satisfy local needs at roughly current levels. (SC/16). Harp Seals*White Sea / Barents Sea* WGHARP expressed concerns on the high removals and declining population resulting from the PBR	Standing

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		likely impact of increasing abundance of these species on fish stocks. For harp seals in the Northwest Atlantic, the immediate management objective is to maintain the stocks at their present levels of abundance.	estimations, and concluded that the estimated equilibrium catches were the most preferred option. The current equilibrium option is slightly higher than the previous option (2012). Possibly a result of no, or very low catches in 2012 and 2013.*Greenland Sea* New aerial surveys to assess harp seal pup production conducted in the Greenland Sea in 2012 and resulted in an estimate of 89,590 (SE 12,310) pups.(SC/20) This estimate is not significantly lower than those from similar surveys in 2002 and 2007. Greenland Sea harp seals are data rich, and ICES found the Precautionary Approach framework appropriate for the population. Using this approach, a modelled catch level of 21,270 1+ animals, in 2014 and subsequent years, is obtained. Any allowable catch should be contingent on an adequate monitoring scheme, particularly if the TAC is set at a level where a decline is expected. *Northwest Atlantic* Aerial surveys to estimate pup production were flown in 2012, and estimates from the southern Gulf of St Lawrence are almost half of estimates from 2008. Years with poor ice conditions have been increasing in frequency over the past decade. Ice conditions observed during 2012, are among the worst on record. This has serious implications for the persistence of breeding harp seals in the southern Gulf of St Lawrence. Hooded Seals *Greenland Sea* During the aerial surveys conducted in the Greenland Sea in 2012, pup production of hooded seals [was] estimated at 13,655 pups (CV 0.14), slightly lower than from the 2005 and 2007 surveys. Hooded seals have been protected since 2007 due to the low pup production numbers – to assess the effect of protection, more than 5 years are needed due to the 4-5 years age at maturity. Results from a re-analysis of hooded seal pregnancy rate data (collected from 1958 to 1999) yielded estimates ranging from 0.62 to 0.74 and	

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			showed no significant differences between sampling periods. The Greenland hooded seal population is considered to be data poor. The population model is similar to the model assessing the abundance of the Greenland Sea and the Barents Sea / White Sea harp seal population. With estimates of pregnancy rates being fairly constant around F=0.7, the model runs indicate a current population size of approximately 83,000 which is well below N30 (30% of largest observed population size). The model predicts a 7% decrease of the 1+ population over the next 10 years. Following the Precautionary harvest strategy previously developed by WGHARP, the implication of this is no current catches from the population (SC/20).	
2.1.9	NAMMCO/16 02-2007	The commission requested the SC to- investigate possible reasons for the apparent decline of Greenland Sea stock of hooded seals; and assess the status of the stock on basis of the results from the planned survey in 2007.	This request was forwarded to the ICES-NAFO WG, which dealt with this request at its meeting in Tromsø in 2008. (SC/15). On the basis of the conclusion of this group, the SC concludes that the reasons for the decline of the stock are still not understood. A reduction in extent and concentration of drift ice has occurred in the Greenland Sea between Greenland and the Jan Mayen Island. These changes must have resulted in substantial changes in breeding habitat for the Greenland Sea populations of harp and hooded seals. Could these changes in ice-conditions have triggered behavioural changes of such a magnitude as a relocation of breeding for at least parts of the populations? Recent low pup production in hooded seals, and new (2007 and 2008) discoveries of breeding harp seals in areas outside those used historically by the species could both be indicative of such changes. Work conducted in Norway (including new assessment of biological parameters) will help in addressing the questions of the maintained low pup production of hooded seals in the Greenland Sea. The SC appreciates the efforts made by Norwegian and cooperating scientists to address the questions related to the apparent decline of hooded seals in	Ongoing

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			the Greenland Sea. It strongly recommends that these activities are given high priority in the coming years. (SC/16)	
		The Management Committee recommended that Council ask the Secretariat to review its cooperation with ICES in light of the Scientific Committee work on harp and hooded seals. It further underlined the importance in getting answers to request R 2.1.9 (NAMMCO/22).	The SC advises the Council that a more formal cooperation between ICES and NAMMCO on harp and hooded seals such as through the ICES WGHARP would be desirable, and that a formal request to ICES for such cooperation could be sent (SC/20).	
2.1.10	NAMMCO/17 09-2008	The SC is requested to provide advice on Total Allowable Catches for the management of harp seals and the establishment of a quota system for the common stocks between Norway and the Russian Federation, leaving full freedom to the Committee to decide on the best methods to determine this parameter based on an ecosystem approach.	The Committee notes that in October 2008, ICES provided advice that was used to set the 2009 quotas for northeast Atlantic harp seals by the Joint Norwegian Russian Fisheries Commission. The SC endorses at its present meeting the advice provided. The committee also notes that WGHARP will meet in August 2009 to review the research activities that are currently in progress, including but not limited to, new pup surveys in the White Sea and collection of new reproduction data during the current hunt in the Greenland Sea. Once these data are available, it will be possible to provide updated advice for the two populations for 2010 and following years. This advice will provide information on the level of total removals that can be sustained.	Standing
		For clarification, the Management Committee for Seals and Walruses wished to specify to the Scientific Committee that the "ecosystem approach" to management for one species involves the use of information about predation from or on other species when quotas are set, but multi-species modelling is not yet at a stage where this can be effected. The TAC are estimated by the Scientific Committee whereas quotas are traditionally set bilaterally by hunting nations (NAMMCO 18).	Dividing the total removals for each population into national allocations is traditionally carried out through bilateral negotiations in the Joint Norwegian Russian Fisheries Commission. Therefore the SC feels it needs clarification from the Council on the request of the establishment of a quota system. The SC also wishes a clarification from Council about the definition of "ecosystem approach" in the establishment of a quota system as stated in the request R-2.1.10. (SC/16).	

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2.3.0	**RINGED SEALS:**			
2.3.1	NAMMCO/5 02-1995	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 present removals in each stock area, effects of recent environmental changes (i.e. disturbance, pollution) and changes in the food supply, and interactions with other marine living resources. The Management Committee endorsed again this request as a standing request (NAMMCO 19). The Management Committee took note of the report from the Scientific Committee and endorsed the idea of a Working Group in 2015 or later when enough information is available (NAMMCO 22).	The Scientific Committee established a Working Group on Ringed Seals. The Scientific Committee considered the report of the Working Group and provided advice to Council. They also provided recommendations for future research. (SC/5). Papers considered by the Working Group as well as other papers were published in the first volume of NAMMCO Scientific Publications, *Ringed Seals in the North Atlantic.* The SC noted that there is currently very little information on stock structure and stock size to consider in relation to both requests (2.3.1 and 2.3.2). Some movement information exists, but these do not give enough information to have understanding of population structure. The SC suggested that a Working Group be considered in the next few years (2015 or later). The WG could look into movements (from the available satellite tagging data) versus where catches are occurring in relation to stock structure. It may also be important to assess this species in light of climate change and changing ice conditions. The SC notes that it is very difficult to obtain the desired information on this species. The Arctic Council recently held a meeting on ringed seals, and it was suggested that the SC considers, at its next meeting, the report from that meeting, and data availability, and considers then the need for a WG (SC/20).	Ongoing
2.3.2	NAMMCO/7 05-1997	The Scientific Committee was requested to advise on what scientific studies need to be completed to evaluate the effects of changed levels of removals of ringed seals in West and East Greenland.	It was noted that the exploitation level of ringed seals in Greenland has shown considerable variability over decades in this century. The Scientific Committee chose to focus on scenarios where exploitation is raised by more than twice the level reported in recent years. The	Ongoing

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		The Management Committee endorsed again this request as a standing request. (NAMMCO 19) See 2.3.1 for update from NAMMCO 22.	Scientific Committee then identified the main gaps in knowledge, and recommended research required to address them. (SC/6). See 2.3.1 for update from SC/20. The SC reiterated that data on this species is sparse and a full assessment is not possible. The SC recommends that a future WG should await results of ongoing tagging studies in central West Greenland, and future genetics studies to elucidate information on population structure (SC/21).	
2.4.0	**GREY SEALS:**			
2.4.2	NAMMCO/11 02-2002	The Management Committee noted that there has been a decline in the numbers of grey seals around Iceland, possibly due to harvesting at rates that are not sustainable. The Scientific Committee had previously provided advice in response to a request to review and assess abundance and stock levels of grey seals in the North Atlantic, with an emphasis on their role in the marine ecosystem in general, and their significance as a source of nematodal infestations in fish in particular (NAMMCO 1995). Given the apparent stock decline in Iceland, an apparent increase in Southwest Norway and in the United Kingdom, and the fact that this species interact with fisheries in three NAMMCO member countries, the Management Committee recommended that the Scientific Committee provide a new assessment of grey seal stocks throughout the North Atlantic. The Management Committee took note of the report from the Scientific Committee and endorsed that the	The Working Group on Grey Seals met in April 2003 and completed an initial assessment of stocks around Norway, Iceland, Great Britain and the Baltic. (SC/11).	Ongoing
			The SC recommends: · Establishment and/or continuation of standardised and regular monitoring programmes for seal abundance in all countries, including the development of appropriate survey methods. · Securing catch records and associated data from hunted seals. · Quantification and standardisation of methods to estimate struck and lost and by-catch. · Population assessment of both species in *Russia*. · Survey of harbour seals along the coast of *Iceland.* · Studies to identify the population structure of *Norwegian* harbour seals.	

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		Working Group on Grey and Harbour Seals meet in 2014/2015 in order to finalise requests 2.4.2 and 2.5.2. (NAMMCO 22).	· Exploration of the south-eastern *Greenland* coast for the presence of harbour and grey seals. · Estimation of the stock identity, size, distribution and structure of the *Faroese* population of grey seals. · Completion of the ongoing genetic analyses of grey seal population structures for the north Atlantic including new samples from the *Faroe Islands.* The SC furthermore recommends · Development of common sampling protocols for all areas in the North Atlantic in preparation for epidemic disease outbreaks, including establishment of blood serum stores for seals sampled. · Compilation of a database of samples stored in the NAMMCO countries. (SC/18) The SC recommended that the Grey and Harbour Seals WG meet in 2014, reflecting the recommendations to finalise the request 2.4.2. (SC/19 and reiterated at SC/20) A Coastal Seals WG meeting has been tentatively scheduled for February 2016 to address R-2.4.2 and R-2.5.2. By February 2016, the CSWG will likely have bycatch estimates and a new complete grey seal estimate in Norway for consideration at the meeting (SC/21).	
2.5.0	**HARBOUR SEAL**			
2.5.2	NAMMCO/16 02-2007	The commission requested the Scientific Committee to conduct a formal assessment of the status of harbour seals around Iceland and Norway as soon as feasible.	At its meeting 2007 (SC/15), the SC recommended that an assessment be conducted in 2010.However, the Norwegian survey will take place in mid-summer 2010, and the results of the survey will probably not be available before early 2011, therefore the SC recommends that an assessment be conducted early 2011. Data on removals are still needed both for Iceland and Norway. (SC/16). The SC reiterated the recommendation that a formal assessment of harbour seals in all areas be carried out by a WG meeting on coastal	Ongoing

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			seals in 2011. SC recommended that a WG on coastal seals be held to review the *Norwegian* management plan for grey and harbour seals, to perform assessments for grey and harbour seals in all areas, and to develop a common management model for both species in all areas. The WG should also consider whether the age data from the catch of grey and harbour seals in *Iceland* would improve the assessment. If a meeting is planned for early 2011, another meeting is likely required to fulfill the task. (SC/17) The SC recommends: Establishment and/or continuation of standardised and regular monitoring programmes for seal abundance in all countries, including the development of appropriate survey methods. · Securing catch records and associated data from hunted seals. · Quantification and standardisation of methods to estimate struck and lost and by-catch. · Population assessment of both species in *Russia*. · Survey of harbour seals along the coast of *Iceland.* · Studies to identify the population structure of *Norwegian* harbour seals. · Exploration of the south-eastern *Greenland* coast for the presence of harbour and grey seals. · Estimation of the stock identity, size, distribution and structure of the *Faroese* population of grey seals. · Completion of the ongoing genetic analyses of grey seal population structures for the north Atlantic including new samples from the *Faroe Islands.* The SC furthermore recommends: · Development of common sampling protocols for all areas in the North Atlantic in preparation for epidemic disease outbreaks, including establishment of blood serum stores for seals sampled. · Compilation of a database of samples stored in the NAMMCO countries. (SC/18)	

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		The Management Committee agreed to change the geographical focus of this request to entail ALL areas. (NAMMCO 19) See 2.4.2 for update from NAMMCO 22.	The SC recommended that the Grey and Harbour Seals WG meet in 2014, reflecting the recommendations to finalise the request 2.5.2. (SC/19 and reiterated at SC/20). A Coastal Seals WG meeting has been tentatively scheduled for February 2016 to address R-2.4.2 and R-2.5.2. By February 2016, the CSWG will likely have bycatch estimates and a new complete grey seal estimate in Norway for consideration at the meeting (SC/21).	
2.6.0	**ATLANTIC WALRUS:**			
2.6.3	NAMMCO/15 03-2006	The Scientific Committee should provide advice on the effects of human disturbance, including fishing and shipping activities, in particular scallop fishing, on the distribution, behaviour and conservation status of walrus in West Greenland. The MC supports the continued planning of the disturbance workshop for beluga and narwhal, and also recommends including walrus (NAMMCO 22; see also R-3.4.9).	With the current actual state of knowledge, the SC is unable to answer this question. The walrus disturbance study on Svalbard will help only in answering the problem of disturbance by tourists. The SC referred, however, to the answer to request 3.4.9. (SC/16). Owing to a lack of explicit studies, the SC is not in a strong position to provide advice on the effects of human disturbance on walrus. (SC/17) With regard to R- 2.6.3, the SC noted that there is no new information available to consider this request (SC/20).	Ongoing
3.1.0	**FIN WHALE:**			
3.1.7	NAMMCO 17 09-2008	The SC is requested to complete an assessment of fin whales in the North Atlantic and also to include an estimation of sustainable catch levels in the Central North Atlantic. This work should be initiated as soon as all estimates become available and before the meeting of the SC in 2009.	The fin whale assessment has been postponed to after the completion of the RMP Implementation Assessment of North Atlantic fin whales scheduled for June 2009. The WG on Large Whale Assessment is scheduled to meet 26-28 January 2010 in Copenhagen with fin whales on its agenda. (SC/16).	Ongoing

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		MC endorsed this recommendation for a Large Whale Assessment Working Group to convene in Fall 2014 (NAMMCO 22).	The SC completed an assessment of North Atlantic fin whales at its 2010 meeting (SC/17). The SC considers that an annual strike of up to 154 fin whales from the WI sub-area is sustainable at least for the immediate 5-year period. It noted that the RMP-variant with a 60% tuning level has yet to be simulation-tested for trials involving stock structure uncertainty in the long term, thus it recommends that simulation trials be carried out as soon as possible and the long-term sustainability of the advice be reconsidered in the light of these results. As the present advice expires in 2015, the NAMMCO SC recommended convening a meeting of the working group on large whale assessments in the autumn of 2014 to provide further management advice on fin whales off Iceland (SC/20). A Large Whale Assessment meeting was previously planned for Fall 2014. This was postponed to Fall 2015, awaiting work to be completed by the IWC on the fin and minke whale RMP Implementation Reviews. The IWC SC has proposed a workshop in January 2015, and plans to complete this work by the IWC SC 66a meeting in June. Therefore, the NAMMCO LWAWG will plan on meeting in the Fall of 2015 in hopes that the work on the IWC SC will be complete (SC21).	
3.2.0	**HUMPBACK WHALE:**			
3.2.4	NAMMCO/15 03-2006	The Commission requested the Scientific Committee to conduct a formal assessment following the completion of the T-NASS. In addition the Scientific Committee is requested to investigate the relationship between the humpback whales summering in West Greenland and other areas and incorporate this knowledge into their estimate of sustainable yields of West Greenland humpback whales.	The SC recommended that the preliminary work to conclude such assessment be made in connection with the fin whale assessment meeting and that abundance estimate from all the surveys be made available to that meeting. (SC/15). With reference to the pending request from NAMMCO 15 (R-3.2.4) to conduct a formal assessment of humpback whales following the completion of T-NASS 2007, the SC noted that it had completed the assessment for West Greenlandic waters. The SC has not yet initiated	Pending

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		The MC recommends that the Large Whale Assessment working group should not consider humpback whales at the upcoming meeting in Fall 2014 (NAMMCO 22).	assessment in other areas and agreed to seek further guidance from the Council regarding that aspect of the request. If the Commission considers request 3.2.4 a priority, the SC will consider this request in conjunction with the fin whale meeting (SC/20).	
3.3.0	**MINKE WHALE:**			
3.3.4	NAMMCO/17 09-2008	The SC is requested to conduct a full assessment, including long-term sustainability of catches, of common minke whales in the Central North Atlantic once results from the 2009 survey become available. In the meantime the SC is requested to assess the short-term (2-5 year) effects of the following total annual catches: 0, 100, 200 and 400. The MC noted that there was no new information regarding this request, and reiterates that the SC should address this request when new information becomes available. (NAMMCO/22)	The Assessment WG was convened to help answer with temporary advice. The SC recommends that 200 minke whales per year be considered as the largest short-term catch that should be contemplated over the short-term, 2-5 years. This catch level refers to total removals from the CIC or Central Medium areas, both Icelandic and others. A full assessment, including the 2009 estimate, will be conducted at the next meeting of the Assessment WG in January 2010. (SC/16). The SC considered that annual removals of up to 216 minke whales from the CIC area are safe and precautionary. The advice is conservative in the sense that it is based on the uncorrected, downward biased 2009 abundance estimate as well as the lower of the two accepted abundance estimates from 2007. Similarly, an annual removal of 121 minke whales from the CM area is a safe and precautionary management advice. (SC/17)	Ongoing
			Response to this request is awaiting the conclusion of IWC Implementation Review (see above), and will be considered at the LWAWG planned for Fall 2015 (SC/21).	
3.4.0	**NARWHAL AND BELUGA:**			

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3.4.9	NAMMCO/14 03-2005	The Scientific Committee should provide advice on the effects of human disturbance, including noise and shipping activities, on the distribution, behaviour and conservation status of belugas, particularly in West Greenland. The MC supports the continued planning of the disturbance workshop for beluga and narwhal, and also recommends including walrus (NAMMCO 22).	The SC conveyed this request to the JCNB/NAMMCO Joint Working Group to consider at their next meeting, probably in late 2007 or 2008 (SC/14). The SC recommended that this item be on the agenda of the meeting of the JCNB/NAMMCO Joint WG, recommended to meet before March 2009. (SC/15). The SC is not in the position to progress on this issue at this point and recommends that habitat-related concerns becomes a standing item on the JCNB/NAMMCO JWG agenda. It may be difficult, if not impossible, to answer the specific request for beluga for several years to come. The SC notes that many of the habitat concerns apply to other marine mammals besides beluga and therefore it may be appropriate to treat all species together in addressing this topic. As a way forward, the SC recommends that the Council consider extending the scope for a more general request with the SC establishing a WG on the impacts of human activities other than hunting on marine mammals in the North Atlantic. Ugarte is suggested as Chair. Terms of Reference for the first meeting would be the evaluation of impact of seismic, shipping and tourist activities on the distribution, behaviour and conservation of marine mammals. (SC/16). The JWG and the SC (SC/19) recommended holding an international symposium on the effect of seismic and other development activities on arctic marine mammals with a focus on beluga and narwhal. Relating to Request 3.4.9: In 2011, the SC proposed a symposium on beluga and narwhals in relation to disturbance and industrial activities. The SC recommends this symposium to be held in 2015 and awaits further guidance from Council before proceeding with the planning (SC/20).	Ongoing

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			The SC recommended broadening the scope of the Symposium and include presentations from other species/research. A number of external experts will be required for this meeting (SC/21).	
3.4.11	NAMMCO/17 09-2008	The Scientific Committee is requested to update the assessment of both narwhal and beluga, noting that new data warrant such an exercise.	The SC endorses the assessment performed by the JWG. Narwhal: noted that the conclusion reached differed from those reached in 2005. It recommends that catches be set so that there is at least a 70% probability that management objectives (population increase) will be met for West and East Greenland narwhals, i.e. maximum total removals of 310 and 85 narwhals in West and East Greenland respectively. Narwhal update: The JWG and the SC (SC/19) agreed that narwhals in Scoresby Sound (Ittoqqortormiit) and Kangerlussuaq-Sermilik (Tasiilaq) should be treated as two separate stocks. The age structure from animals collected between 2007 and 2010 in Ittoqqortormiit was applied to both areas, and the harvest was found to select older animals. It was estimated that narwhals in the Ittoqqortormiit area have increased slightly, while narwhals in the Tasiilaq/ Kangerlussuaq area might be stable. The current growth rate in the absence of harvest was estimated to lie between 1.2% (95% CI:0–3.5) and 3.7% (95% CI:1.6–5.9), depending upon model and area. Proposed quotas ranged from 17-70% (Ittoqqortormiit) with probability of 95-70% increase in population and 0-18 (Tasiilaq) with probability of 95-70% increase. Beluga: the catch of belugas in West Greenland has been reduced in response to previous advice. These reduced takes already seem to be having a positive effect on population size. The modelling for belugas rests on a more solid background than that of narwhals because of simpler stock structure, however since there is still uncertainty in the assessment, the SC strongly recommends that future catches be set according to the probability of population increase of at least 70%. Annual takes between 180 to 310 individuals over the next 5 years will	Standing

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			leave the population a 70% to 95% probability of a continued increase until 2014. (SC/16). Beluga update: The JWG considered, and SC agreed (SC/19), that the revised assessment models, which incorporate the age structure data but no new abundance estimate, confirmed that the current removals based on the 2009 advice are sustainable. Based on a 70% probability of population increase, it is concluded that a total annual removal of 310 beluga in West Greenland (excluding Qaanaaq) is sustainable. A new and updated advice is expected at the next meeting based on a new abundance estimates from the spring survey in 2012, and the SC noted that new abundance estimates for assessments should be available at least every 10th year. No specific advice was given on the North Water (Qaanaaq), since the current removals remain at a low level relative to the population size. No advice was given for the harvest in Canada. Results from different scenarios of the age structured population dynamic model were presented, providing annual growth rate estimates from 3.2% to 5%, in the absence of harvest. The depletion ratio for 2012 was estimated to 44% (95% CI: 16%–88%), with a yearly replacement of 510 (95% CI:170–780) individuals. (SC/19)	
3.5.0	**SEI WHALES:**			
3.5.3 amended	NAMMCO/19 09-2010	The Scientific Committee is requested to assess the status of sei whales in West Greenland waters and the Central North Atlantic and provide minimum estimates of sustainable yield.	The Scientific Committee notes that the RMP could be applied using existing data. The resulting catch limits would consequently be lower than the stock could sustain. A prerequisite for initial assessment work is the recalculation (including considerations of extrapolation) of abundance estimates for a comparable area and assessing the extent of negative bias for the reasons mentioned above. Advice based on an RMP approach would require an initial assessment and likely the development of implementation trials. (SC/18)	Ongoing

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		MC endorses the suggestion from the SC to wait for the outcome of the IWC SC review before conducting their own review (NAMMCO 22).	There is no new information available with regards to this request. The SC noted that the SC of the IWC has initiated a review of available data on North Atlantic sei whales with the view conducting an RMP implementation. Given the busy schedule of the IWC RMP sub-committee, such an implementation is not expected to be completed until 2017 or later. To avoid double work, the NAMMCO SC agreed to monitor the outcome of the IWC SC review of available data scheduled in 2014 before proceeding with an assessment. (SC/20).	
3.7.0	**KILLER WHALES:**			
3.7.2	NAMMCO/13 03-2004	The Management Committee requested the Scientific Committee to review the knowledge on the abundance, stock structure, migration and feeding ecology of killer whales in the North Atlantic, and to provide advice on research needs to improve this knowledge. Priority should be given to killer whales in the West Greenland – Eastern Canada area. MC notes the SC report that there is no new information available for R-3.7.2 (NAMMCO 22).	The Scientific Committee concluded that there was not enough information to carry out the assessment at this time, particularly for the West Greenland area. The Scientific Committee will review new information on killer whales annually with the aim of completing the assessment once sufficient information becomes available for a particular area. Not enough information still. (SC/15). Situation unchanged (SC/16). The SC again noted that there is not sufficient new information to answer this request at this time (SC/20). There is still not enough information to answer the request. Unfortunately catch information in Greenland was not available for review by the SC at this meeting (SC/21).	Ongoing
3.8.0	**LONG-FINNED PILOT WHALES:**			

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3.8.3	NAMMCO/16 02-2007	The Management Committee noted that it had been over 10 years since the SC concluded its assessment of pilot whales. It was recommended then that a monitoring programme for pilot whales caught in the Faroes drive hunt be implemented. The Commission requested therefore the Scientific Committee to develop a proposal for the details of a cost-effective scientific monitoring programme for pilot whales in the Faroes.	The SC convened a WG for developing such a proposal, under the chairmanship of C. Lockyer. The monitoring programme is under development. (SC/15). In 2008, the SC presented a detailed plan with options for different scales of monitoring relative to costs. In particular, the SC noted that it needed an intensive short–term catch sampling programme of sex and age distribution over a 3-year period to be implemented in order to assess the variability within- and between years and compare with the 1986-88 sampling programme, before it could identify a cost effective long-term monitoring plan. Such a short-term programme has not been implemented yet, so the SC has not considered this issue again for 2009. (SC/16). The Faroes have increased the efforts in the sampling program of harvested animals, prioritizing obtaining ages, skin samples, and reproductive parameters for each animal. A total of 270 animals were sampled in 2013 (SC/21).	Ongoing
3.8.4	NAMMCO/16 02-2007	Bearing in mind that T-NASS in 2007 was expected to provide a better basis for an updated abundance estimate for pilot whales in the North Atlantic, the Commission requested the SC to make sure that both the methodology and the coverage of T-NASS take into account the need for reliable estimates for pilot whales. In addition, priority should be given to the analysis of data on pilot whales after the completion of T-NASS. The MC commented on the wording of "concern for managers" in the SC report. Mikkelsen reported that the concern lies with the issue that it is unknown how the animals in the abundance estimates are related to	The T-NASS committee took pilot whale into consideration when designing the survey. The WG on Abundance Estimate reviewed the data collected and gave advice for analysis and recommended that these be initiated immediately. The Faroes took the lead in this. (SC/15). See item 1.7.11 (SC/16). The SC recommended in 2009 that an index of relative abundance be developed and applied to the area that is common to all surveys, with the aim of determining trends in abundance over the full period of the NASS. Pike et al. (SC/20/18) was presented at SC/20. CDS was used to develop indices of relative abundance. The results are suggestive of a decline in abundance over the past two decades, although no firm conclusions could be reached about the reality or causes of the apparent decline in the relative abundance of pilot whales in the index areas. The	Ongoing

Code	Meeting	Request	Response of the Scientific Committee	Status
		the stocks that contribute to the hunt in the Faroes. Ongoing work will continue into abundance estimates and stock identity. The MC noted that a new abundance estimate is anticipated after TNASS2015 (NAMMCO 22).	role of operational changes in the surveys is equivocal and could have led to either a reduction or exaggeration of the observed trend. If the trend is real, it may have been caused, enhanced or lessened by possible changes in the wider distribution of pilot whales in the area. Although it seems very unlikely that an annual harvest of around 1,000 whales could have caused the population to decline, the apparent reduction of pilot whale abundance in the index areas, which includes the hunting area around the Faroes, should be of concern for managers (SC/20).	
3.8.5	NAMMCO/19 09 2010	The Scientific Committee is requested to assess the status of long-finned pilot whales in West Greenland waters and provide minimum estimates of sustainable yield.	The SC recommends that a pilot whale WG meeting be held to perform assessments and aim at providing advice on sustainable removals for pilot whales around the Faroes Islands and West Greenland. This meeting awaits progress on abundance estimates and stock structure from the Faroes.(SC/18) Update: The average annual catch of long-finned pilot whales in West Greenland during 1993-2007 was 126 whales. An aerial survey conducted in 2007 with partial coverage of the potential pilot whale habitat (Figure 4, above) revealed an abundance of 7,440 animals (95% CI 3,014-18,367) which has been approved by the NAMMCO SC. Applying a PBR approach (rmax of 3% and recovery factor of 1), it is suggested that a sustainable harvest level of pilot whales taken from this abundance would be around 50 whales per year. An estimate based on the AWMPc procedure, suggests that an annual take 70 whale is sustainable. However, the survey did not cover the entire range of pilot whales in West Greenland and the summer aggregation in West Greenland cannot be considered an isolated stock. Instead, it is likely connected to pilot whales along Labrador and at Newfoundland, and the occurrence and abundance in West Greenland is probably influenced by the sea temperature regimes in the area (Fullard *et al*. 2000), although the extent of this is not known. (SC/19)	Ongoing

Code	Meeting	Request	Response of the Scientific Committee	Status
3.8.6	NAMMCO 20 09 2011	The Scientific Committee is requested 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. In the short term, the Scientific Committee was requested to provide a general indication of the level of abundance of pilot whales required to sustain an annual catch equivalent to the annual average of the Faroese catch in the years since 1997.	The SC (SC/19) agreed that it was unlikely that a full assessment could be attempted in the near future. Regarding a short term advice, the SC noted that both the AWMPc procedure (which has been used for preliminary advice for baleen whales in West Greenland by NAMMCO and the IWC), as well as the PBR approach, could be used for an inverse advice calculation of the minimum abundance required to sustain the average take by the Faroese. With the average annual catch by the Faroese since 1997 being 678, and the CV of the latest abundance estimate being 0.27, the AWMPc procedure estimates that an abundance estimate around 50,000 pilot whales and a similar precision is required to sustain the catch. In comparison, the PBR approach (rmax of 3% and recovery factor of 1) calculates an abundance estimate around 80,000 whales. These calculations reflect precautionary estimates of the minimum abundance estimates required to sustain the Faroese hunt. However, the geographical range of the stock(s) that supply the Faroese hunt is unknown, and it is unresolved how the calculated estimates compare with the accepted estimate of 128,000 (95% CI: 75,700-217,000) pilot whales from the Icelandic and Faroe Islands area of T-NASS. The next assessment will not occur until after the next sightings survey (SC/21).	Ongoing
3.9.0	**DOLPHIN SPECIES *(Tursiops* and *Lagenoryhncus spp.):***			
3.9.6	NAMMCO/13 03-2004	The Management Committee has asked the Scientific Committee to carry out assessments of these species, but to date insufficient information has been available on stock delineation, distribution, abundance and biological parameters to initiate the work. The Committee was pleased to note that considerable progress has been made in the Faroes in describing the ecology and life history of white-sided	There is still insufficient data on these species to conduct an assessment, but the SC recommended that abundance be estimated for white-sided and white-beaked dolphins from the 2007 T-NASS survey as soon as possible. An assessment of the species could be attempted in 2009 at the earliest. (SC/15). The Committee notes that there are still not enough data (life history and abundance) for any of the three species to complete an assessment.	Pending

Code	Meeting	Request	Response of the Scientific Committee	Status
		dolphins and that information on white-beaked dolphins should be available from Iceland and Norway in about 2 years time. Abundance estimates are lacking in all areas except Icelandic coastal waters, and no information on stock delineation or pod structure is yet available. The SCANS survey planned for 2005/6 and coastal surveys planned for Norway (see 9.3) should provide information on distribution and abundance in some areas. The Committee endorsed the plan of the Scientific Committee to proceed with the assessments once the above-mentioned studies have been completed, probably by 2007.	The Faroes have samples for diet and life history parameters from 350 white-sided dolphins, but the analysis is not completed yet. (SC/16). The SC noted that the data on life history and abundance for any of the three species is still not sufficient for an assessment and recommended that Faroese samples for diet and life history parameters from 350 white-sided dolphins be finalised and at the same time that an abundance estimate from the 2007 survey be attempted. (SC/17) The SC noted that there is no new data available to answer this request. Mikkelsen informed that the data collected from the drive hunt of white sided dolphins in the Faroes will be published before the next SC meeting (SC/20). The SC noted that there is no new information for tursiops bottlenose dolphins from the Faroes and the analysis from previous studies of white sided dolphins have not been completed (SC/21).	
3.10.0	**HARBOUR PORPOISES:**			
3.10.1	NAMMCO/7 05-1997	The Council noted that the harbour porpoise is common to all NAMMCO member countries, and that the extent of current research activities and expertise in member countries and elsewhere across the North Atlantic would provide an excellent basis for undertaking a comprehensive assessment of the species throughout its range. The Council therefore requested the Scientific Committee to perform such an assessment, which might include distribution and abundance, stock identity, biological parameters, ecological interaction, pollutants, removals and sustainability of removals.	The Scientific Committee decided that the matter could best be dealt with by convening an international workshop / symposium on harbour porpoises, which would involve experts working on this species throughout its North Atlantic range. The agenda would include the following themes: distribution, abundance and stock identity; biological parameters; ecological interactions; pollutants; removals and sustainability of removals. (SC/6). The Scientific Committee utilised the report of the Symposium to develop its own assessment advice to the Council. Recent abundance estimates are available for only a few places in the North Atlantic. Directed harvesting occurs in some areas, but most removals are through by-catch. In some areas, present removals are not sustainable. The Scientific Committee developed research recommendations to	Ongoing

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			address some of the information needs for management of this species. (SC/8). The SC considered that formal assessments for this species were warranted for Greenland, Iceland and Norway, but that there was insufficient information on abundance in all areas and removals in Iceland and Norway to conduct assessment at this time. (SC/ 14). Estimates of abundance and removals are still needed in all areas. The T-NASS survey will provide an estimate for the coastal area around Iceland, and maybe Greenland but will not do so for other areas. (SC/15). Information was still lacking on abundance in all areas and removals in Faroes, Iceland and Norway in order to conduct an assessment. Such an assessment can be performed when the ongoing analyses cited above are completed, maybe end of 2010 or early 2011, providing that data on total removals are also available. (SC/16). The SC recommended that an assessment meeting for harbour porpoises in all areas be held during the winter 2011/12. The SC recommended that the Faroese authorities make sure that obligatory reporting of takes of harbour porpoises is effective. Total removal estimates should be obtained for all areas before the planned WG meeting. It also recommended that abundance estimates from the 2007 survey in Iceland and the 2010 survey in the Faroe Islands become available before the meeting. (SC/18) Greenland reported that they had sufficient data for an assessment of harbour porpoises in West Greenland. A catch history is available, a recent abundance estimate, as well as two samples of the age structure (from 1995 and 2010). The SC also noted the existence of abundance estimates from both Iceland and the Faroe Islands, as well as some estimates of by-catch in Iceland. (SC/19) The NAMMCO Working Group on Harbour Porpoises met in Copenhagen 4-6 November 2013. This was the first meeting and terms	
		The Management Committee recommends that total removal estimates are made for all areas, and that abundance estimates from the 2007 survey in Iceland and the 2010 survey in the Faroe Islands are available before a WG meeting. (NAMMCO 19).		

Code	Meeting	Request	Response of the Scientific Committee	Status
			of reference was to provide a full assessment for West Greenland, and to initiate the process for Norway, including a review of the method used for obtaining total by-catch estimates. *Greenland* Given the large degree of uncertainty in the abundance estimate and the catch history, and the effect of this on the results of the assessment models, the working group was unable to provide management advice for West Greenland at this time. Nevertheless, the working group noted that the average annual catches since 1993 in West Greenland were 2126 harbour porpoises and that a large abundance is needed to sustain such catches. Given the recent discovery of high uncertainty in catches, the working group strongly recommended that Greenland provides a complete catch history accounting for all types of underreporting of catches before any future attempts are made to conduct an assessment of harbour porpoises in West Greenland. The working group noted that T-NASS 2015 may provide a new abundance estimate for West Greenland and recommended that a new assessment not be considered until the outcome of this survey is known. Taking into consideration the work of the HP WG, the SC recommends the following: *Greenland* 1.Given the recent discovery of large uncertainty in catches, the SC strongly recommends that Greenland provides a complete catch history including all types of underreporting of catches before any future attempts are made to conduct an assessment of harbour porpoises in West Greenland.	

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		The MC endorses the recommendations of the SC (NAMMCO 22).	2.The SC noted that T-NASS 2015 may provide a new abundance estimate for West Greenland and recommended that a new assessment not be considered until the outcome of this survey is known**.** *Norway* 1. That Norway expand the information about by-catch giving the next priority to the lumpfish fishery by-catch. 2. That surveys to estimate abundance in Norwegian coastal and fjord waters are carried out. These surveys should focus in the areas of highest by-catch (Vestfjorden). (SC/20) 3. That both tracking and genetics studies be carried out to clarify stock delineation. Reliance on genetics data alone is not enough because movements are needed to inform on mixing and dispersion of the animals on a management time scale. 4. That samples be collected from by-catches in Norway, to obtain data on sex ratio, reproductive status, age structure, diet, contaminants, etc. Again, the efforts should focus on the Vestfjord area, where most of the by-catches occur. A future harbour porpoise WG will be scheduled after a report from the Bycatch WG, new data from TNASS2015, and progress on research requests from the 2013 HPWG (SC/21).	

SECTION 3 SCIENTIFIC COMMITTEE

3.1 REPORT OF THE 21ST SCIENTIFIC COMMITTEE MEETING

Executive summary

The 21st meeting of the Scientific Committee (SC) was held in Bergen, Norway, 3 – 6 November 2014. The SC had the T-NASS Steering Committee- Proposal for T-NASS2015 and report from the NASS2015 Joint Technical, Planning and Steering meeting (Annex 1), and a summary of the NAMMCO-Joint Commission on Narwhal & Beluga (JCNB) Catch Allocation Sub-group Meeting (SC/21/07). National Progress Reports (NPRs) were received from all member countries and observers except for the Greenlandic NPR, which was not received in time for consideration at the meeting. Other reports and documents were presented and were examined under the relevant agenda items.

COOPERATION WITH OTHER ORGANISATIONS

ASCOBANS plans to write to the EU regarding the Faroese pilot whale hunt. The SC and Secretariat did not know if this letter had been written at the time of the SC meeting. These issues are usually handled by the Ministry of Foreign Affairs.

Formally NAMMCO and ASCOBANS have an official agreement on exchange of observers. The **SC recommended** that the NAMMCO Secretariat request harbour porpoise by-catch numbers for the North Sea from ASCOBANS, when needed for future assessments/WGs.

A request for NAMMCO to join the ICES WGHARP was sent from the NAMMCO Secretariat to the ICES Secretariat in August 2014.

Role of Marine Mammals in the Ecosystem

The traditional perception of prey species preference of killer whales in the Northeast Atlantic has, to a large extent, been linked to herring. Recent Norwegian research on the ecology of killer whales in the Norwegian Sea during two summer-season ecosystem-based surveys 2006 and 2007, quantified spatial overlap between killer whales and the three most common pelagic fish species. No spatial relationships were found with herring or blue whiting. However, a significant relationship and spatial overlap with mackerel. Killer whale group size was also correlated to the size of mackerel trawl catches, indicating active group size adjustment to available prey concentrations.

In the years 2007–2011 a high priority part of the planned Joint Norwegian-Russian Research Programme on Harp Seal Ecology was to deploy satellite transmitters in the White Sea. Permits by the Russian Authorities were first given in 2012–2014, but unfortunately a lack of funding then prevented tagging. An application for funding has now been submitted to the Norwegian Research Council, and during the tagging experiment, PINRO will provide the necessary logistics required for helicopter- or boat-based live catch of seals in April–May 2015. For proper planning and budgeting in both institutes, a PINRO scientist must obtain the necessary permissions from Russian authorities before December 2014.

By-catch

In Iceland it is mandatory to report all by-catch of seabirds and marine mammals. Some reporting of marine mammals in the bottom set gill net fishery started in early 2002 covering about 5% of the cod gill net fleet and continued up to 2009 when a new electronic log-book system was implemented. No records have been received from the new system. Main sources of information are the annual cod gill net survey that is about 2% of the fleet effort in April and is distributed in line with the fleet effort by area. Recent reports have been received from the lumpsucker net fishery and the inspectors from the Directorate of Fisheries and scientists that reported by-catches and these data were compared to log-book records from the fleet to estimate the proportion of by-catch reported. The harbour porpoise is the most commonly by-caught marine mammal and according to the calculations the by-catch in gill nets has decreased since 2003, from 7,300 animals to about 1,600 animals in

2009–2013, in line with decreased cod net effort. With 400 in lumpsucker nets, the total has likely been about 2,000 animals from 2009 or 1.2–6.5% of the abundance estimate range calculated from an aerial survey. If a recent increase seen in the net survey numbers is factual and reflects an increase in the stock due to the reduced net fishery effort, then the replacement potential must be much higher than the 1.7% precautionary reference point usually used for harbour porpoise. Porpoises also occur in deep waters outside the aerial survey range where no estimates exist. By-catch of harbour seal and grey seal was estimated 705 and 140 for 2013. The aim of defined management objectives is to keep these stocks above a certain level and the stocks were around the set limit in the last counts.

In Norway the IMR receives by-catch data via the research reference fleet. There is also mandatory by-catch reporting in all fisheries, but the Directorate of Fisheries seems not to receive any reports of by-caught marine mammals. The monkfish fishery that uses gill nets is a serious issue, but the reference fleet has not yet been expanded to this fishery.

The **SC noted** that the lack of by-catch recording in the gill net fishery from the log-book system implemented in 2009 in Iceland is of great concern. A functioning by-catch recording system is of high priority. The **SC noted** that a future HPWG meeting requires information on by-catch from all areas before the assessment can continue. With this new information from Iceland, and the information from the reference fleet in Norway, the **SC recommends** convening a By-catch Working Group. This would be a technical WG that could focus on discussing the methods that are being used to collect the data and extrapolate the results, and decide if further work is required. Prior to the By-catch WG meeting, it will be important to have updated numbers from the reference fleet in Norway and to compile necessary fisheries data from management agencies, and including spatial and temporal effort for most specifically the net fisheries.

The SC **noted** that the outcomes from the By-catch Working Group should also be considered by the Coastal Seals WG. Therefore the SC **suggested** that the CSWG be postponed until 2016 and that the By-catch WG could meet just prior to the CSWG.

Environmental issues

Investigations on how ice breeding seals can adapt to habitat loss in a time of climate change have revealed that Northwest Atlantic harp seals responded to poor ice conditions differently, depending on the presence or absence of ice at the beginning of the pupping period. If no ice was present, females moved away from their traditional whelping areas to find suitable ice. If small amounts of ice were present, females gave birth even if the ice was too thin to sustain the pups, resulting in high pup mortality. There was no evidence to indicate that harp seals pupped on land even in areas where ice was absent. Young seals that drifted to shore had high levels of abandonment and mortality.

It has been known for a long time that these glacier front areas are important feeding areas for seabirds and marine mammals in Svalbard. Recent satellite tracking studies have shown that many of Svalbard's ringed seals spend the whole year in front of various glacier fronts, and white whales have been shown to spend about 55% of their time during summer and autumn at these sites. Glacier-ice pieces floating in coastal areas are also important for all seal species in the region as dry platforms during moulting and also as general resting platforms for both birds and seals. During the last decade there have been several years with a complete lack of spring sea ice in many of the fjords along the west coast of Spitsbergen. During the spring periods in these years, bearded seals have replaced their regular sea-ice platform with glacier ice, using it as a solid substrate for both birthing and nursing as well as general resting.

Three ice-associated cetacean species reside year-round in the Arctic: the narwhal, the beluga and bowhead whale. Sites of oil and gas exploration and development and routes used for commercial shipping in the Arctic are being compared with the distribution patterns of the whales, with the aim of highlighting areas of special concern for conservation. Measures that should be considered to mitigate the impacts of human activities on these Arctic whales and the aboriginal people who depend on them for subsistence are now being discussed.

SEALS AND WALRUS

Harp and Hooded Seal

Aerial surveys were carried out by PINRO in March 2013 to estimate pup production in the White Sea where

Ice conditions were corresponding to the long-term average. This yielded a total pup production number of the White Sea/Barents Sea harp seal population of 128,786 (CV=0.237).

IMR has now started experiments with Unmanned Aerial Vehicles to perform aerial photographic surveys of harp and hooded seal whelping patches on the drift ice. With some technical improvements on both aircrafts and operational equipment a new survey, will be conducted in the West Ice in 2015.

Photographic and visual aerial surveys had been conducted off Newfoundland and in the southern Gulf of St. Lawrence to determine pup production of Northwest Atlantic harp seals in 2012 and resulted in an estimated total pup production of 790,000 (SE=69,700, CV=0.088). This estimate is approximately half of the estimated number of pups born in 2008, likely due to lower reproductive rates in 2012 compared to 2008.

A population model had been used to examine changes in the size of the total Northwest Atlantic harp seal population between 1952 and 2014. Pup production declined throughout the 1960s reaching a minimum in 1971, and then increased to a maximum in 2008. The total population size in 2012 were estimated to be 7,445,000 (SE=698,000). The maximum estimated population size, N_{max}, was estimated to be 7.8 million animals in 2008. The population appears to be relatively stable, showing little change in abundance since the 2004 survey, although pup production has become highly variable among years. Data on age-specific pregnancy rates indicate that herd productivity has declined compared to the 1980s and early 1990s. The SC discussed that the carrying capacity used in the modelling might need to be reduced because it appears that there may be density dependence influenced drops in reproduction at a lower carrying capacity than is being used.

Telemetry studies on West Atlantic hooded seals have provided very detailed information on distribution and diving patterns. The important feeding areas have also been identified using two different methods.

The ICES Working Group on Harp and Hooded Seals will meet again in November 2014 in Quebec, Canada, to review the status and assess the catch potential of harp seals in the Barents Sea/White Sea and in the Northwest Atlantic and hooded seals in the Northeast Atlantic.

Ringed seal

The SC noted that the Arctic Council's working group "Conservation of Arctic Flora and Fauna" (CAFF) has a working group on ringed seals throughout the Arctic where a lot of important work is being presented, and includes suggestions for future monitoring on this species. The SC had previously suggested convening a Working Group in the next few years (2015 or later), but this year the SC noted that the CAFF group is likely a better forum; however, the SC was not sure if CAFF is planning more meetings. The SC reiterated that data on this species is sparse and a full assessment is not possible. The **SC recommends** that a future WG should await results of ongoing tagging studies in central West Greenland, and future genetics studies to elucidate information on population structure.

Grey seal

A recent study on the global population structure and demographic history of grey seals showed a high degree of genetic differentiation between regions. Highly asymmetric patterns of gene flow were inferred, with the Orkney Islands being identified as a source of emigrants to other areas of the eastern Atlantic. The Faroese grey seals are closely related to grey seals around the UK. The Baltic and eastern Atlantic regions were estimated to have diverged a little over 10,000 years ago, consistent with the last proposed isolation of the Baltic Sea.

The most recent pup production estimate of grey seals in Norway is based on data obtained in 2006–2008. The management plan for coastal seals now implemented in Norway require data used in assessments updated every 5 years. A boat-based visual survey aimed to obtain a new abundance estimate for the species in Norway started in November 2013 and continued in 2014. Some of the new estimates obtained in mid Norway were much lower than in the previous survey, and quotas were immediately reduced in these areas as a result.

Coastal Seals WG

A Coastal Seals WG meeting has been tentatively scheduled for February 2016 to address R-2.4.2 and R-2.5.2.

By February 2016, the CSWG will likely have by-catch estimates and a new complete grey seal estimate in Norway for consideration at the meeting.

Harbour seal
Aerial surveys aimed to obtain a new abundance estimate for harbour seals in Norway were started in 2011, and continued in 2012 and 2013 and supplemented with results from boat-based visual surveys in 2014, resulting in a final point estimate of 7,533 for the species for the entire Norwegian coast. This new estimate has been implemented in the 2015 management of the species; this management now follows the management plan reviewed by NAMMCO SC in 2011. Norway is now in the process of developing a model for management of harbour seals, which will include uncertainties around by-catch.

Surveys in Greenland searching for new haulouts have found 3 new colonies since 2009.

Iceland experimented with using drones for a survey this year. There are plans for full survey next year.

Walrus
A survey was completed in Greenland in early April 2014 only covering the eastern coastal part of the North Water with more than 30 sightings and should allow for a new abundance estimate to be developed soon. Together with updated hunting statistics, this new abundance estimate could be used for a revised assessment for this particular stock with a possible update on advice. The Walrus Working Group (WWG) should resume for a one day meeting or teleconference in March 2015 to address the possibilities for updating advice on sustainable takes of walruses in the Baffin Bay stock. If feasible, the meeting could be conducted as a teleconference.

In new a project in Svalbard sponsored by the Norwegian-Russian Environmental Commission 20 adult male walruses were instrumented with GPS loggers in 2014 and should collect GPS positions for at least five years. Blood and blubber samples were collected from these animals for various studies. New methods resulted in 0 mortality.

Newly published results from the recent survey of walrus haulout sites in Svalbard provides updates regarding the increasing numbers of land- based haulout sites, occupied sites, sites with mother-calf pairs, and a 48% increase in abundance in the six-year period between the two surveys to 3,886 (CI: 3,553-4,262) animals, including animals in the water at the time of the survey.
Several walrus research projects are ongoing in the Pechora Sea around Dolgy Island that are sponsored by a Russian oil and gas company and coordinated by the Russian public organization "Council of Marine Mammals" from Moscow.

CETACEANS

Fin whale
The distribution of fin whale catches in Iceland in 2014 was very different from any previous whaling season since the resumption of whaling in 1948. Whale densities appeared to be very low on the traditional whaling grounds west of Iceland and the bulk of the total catch of 137 fin whales were taken south of Iceland. Preliminary analysis of stomach contents suggest that this changed distribution may be due to shortage of krill in the Irminger Sea.

In 2013 a fin whale/blue whale hybrid was caught in the Irminger Sea west of Iceland. This is the fifth confirmed hybrid between these two species in Icelandic waters.

A Large Whale Assessment Working Group (LWAWG) meeting was previously planned for the fall of 2014. This was postponed to Fall 2015, awaiting work to be completed by the IWC on the fin and minke whale *RMP Implementation Reviews*. The IWC SC has proposed a workshop in January 2015, and plans to complete this work by the IWC SC 66a meeting in June. Therefore, the NAMMCO LWAWG will plan on meeting in the Fall of 2015 in hopes that the work on the IWC SC will be complete.

Minke whale
A recent study investigating the genetic structure of northeast Atlantic minke whales conducted a spatial,

temporal and cryptic population analysis of 2,990 whales harvested in the northeast Atlantic during the period 2004 and 2007–2011. This large data set, which had been genotyped according to strict protocols upon which the Norwegian minke whale DNA register is based, failed to reveal any indication of geographical or temporal population genetic structure within the northeast Atlantic based upon the analysis of ten microsatellites and 331 bp of the mitochondrial D-loop. Furthermore, while three mtDNA lineages were revealed in the data, these did not show any underlying geographic pattern, and possibly represent an ancestral signal. The obtained results give no genetic support to maintain the five management areas in the northeast Atlantic.

As a part of the IWC's RMP Implementation Review extensive revisions of management areas have been agreed. These include large reductions in the number of management areas. Although the latest genetic evidence suggest that there is only one stock in the North Atlantic, the IWC SC decided to retain the three main medium areas (E, Central, W) as a precautionary measure.

The sixth and last year of the six-year programme 2008-2013 to cover the northeast Atlantic to provide a new abundance estimate of minke whales every sixth year as part of the management scheme established for this species, was conducted during summer in 2013. The covered area was the IWC *Small Area EB* (eastern Barents Sea) which is part of the Medium Management Area E, comprising waters in the northeast Atlantic.

A wider distribution, compared to previous surveys, was observed during the last Russian-Norwegian Ecosystem Survey and from other observations in the Barents Sea between August and October. Several animals were observed in the far north-eastern part of the Barents Sea on the border with the Kara Sea.

Beluga and Narwhal

A programme continued with satellite tracking and collection of blood and blubber samples for various investigations of pollution, diet and health status of Svalbard white whales. Eight animals were captured for this purpose in the summer of 2014. At least one more field season will be needed before analysis will begin.

The Catch Allocation Sub-Group of the NAMMCO-Joint Commission on Narwhal & Beluga met in Copenhagen on 10–12 March 2014 with the main purpose of developing an allocation model that will provide a mechanism for assigning harvested animals (narwhals) to summer stocks. After review of available information on movements and phenology of narwhals in Canada and Greenland a matrix model with columns for harvest locations and rows for stocks was developed. Allocation of catches to stocks was based on different criteria of levels of availability ranging from no availability for stocks that with certainty did not contribute to the hunt, to stocks that definitely supplied the hunt at identified hunting localities. The model could potentially be used for both estimating the fraction of the hunt that is supplied from each summering stock as well as the sustainable takes at each hunting locality. The sub-group will meet again in March 2015 to finalize the model and update the assessment of narwhal and belugas.

Potential problems may arise if hunters take their whole quota from a single small stock. One way to reduce the risk of this is to look at within season movements with satellite tags to see how the stocks' movements overlap.

Killer whale

A 3-year research project on feeding behaviour, movements and acoustics of killer whales in Icelandic waters conducted by the MRI will be finalized in 2015. Photo-identification has revealed several instances of movement of killer whales between the Shetland Islands and Iceland.

Killer whales in SE Greenland were found to have tooth wear that looks like they are fish eating killer whales but seals were found in the stomachs. Ten years of observational and photo-identification data of a population of killer whales that follows the Norwegian spring-spawning stock of Atlantic herring were predominantly observed feeding upon herring. One pod of herring-eating whales was also observed interacting with seals. This supports the hypothesis based on the long-term markers, of a degree of specialization, with a small number of groups persistently feeding upon mammals, but switching between herring and seals. Playbacks of herring-eating killer whale sounds to harbour seals at haulout sites on the herring spawning grounds caused changes in behaviour consistent with an anti-predator response.

Pilot whale
The Faroes have increased the effort in sampling programme of harvested animals to a total of 270 in 2013, prioritized obtaining ages, skin samples, and reproductive parameters for each animal. Satellite tagging will be conducted in 2015 prior to T-NASS2015 survey activities.

Harbour porpoise
In contrast to previous taggings, the fifteen porpoises tagged off West Greenland in 2014 stayed on the continental shelf throughout September. Greenland also sampled about 150 porpoises from the hunt from June-October to complement previous sampling efforts from September 1995 and 2009 and to look at possible seasonal changes. The porpoises seem to react positively to climate change in terms of increased body mass. Stomach contents showed increased diversity of prey between 1995–2009, with large amounts of cod in 2009.

A future harbour porpoise WG will be scheduled after a report from the By-catch WG, new data from T-NASS2015, and progress on research requests from the 2013 HPWG.

Bowhead whale
A new abundance estimate for the population in West Greenland using genetics is larger than from aerial surveys, probably because of segregation of animals that mostly summer in the Canadian High Arctic. These results confirm an earlier assumption based on data that showed 83% of the whales passing through West Greenland were females, and older than 40 years, therefore the population must consist of more animals.

The programme using passive acoustic monitoring devices for bowhead whales in Framstredet and north of Svalbard is ongoing. Four units were deployed in 2013 and 3 retrieved and redeployed in 2014.

Blue Whale
Animals identified earlier via photo-id off West Iceland in mid-summer were identified north of Iceland in mid-summer in recent years. One blue whale was satellite tagged in 2013 and two in 2014 north of Iceland. The whale tagged in mid July 2013 travelled southwards to 59° N. The whales tagged in 2014 travelled north of Iceland towards 73° N. There has been a notable increase in the numbers of blue whales seen in Svalbard over the last 2–3 years. This year there were also many sighting during the Norwegian Sightings survey and the Arctic part of the Ecosystem survey. Perhaps those whales moving north from Iceland to the Svalbard area.

Iceland has been collecting biopsies and has 10-20 samples currently being stored in the MRI archive.

Global review of monodontids
The planning for a Global Review of Monodontids symposium has begun. Preliminary plans are to hold the meeting in conjunction with the Marine Mammals of the Holarctic meeting in the fall of 2016 in Russia.

Lockyer attended the Holarctic meeting this year in St Petersburg, Russia and discussed this venture with the organisers. In a proposal for the symposium the following items were included:

- The proposal is for a 3-day scientific symposium - workshop, with invited experts on monodontids, and about 50 international participants
- The focus of the scientific symposium - workshop would be a comprehensive review of all aspects of the biology and study of belugas and narwhals in all regions where they occur
- The scientific symposium-workshop should be held in conjunction with the 2016 Conference on Holarctic Marine Mammals – before or after the event
- The rationale being that this conference is attended by many Russian experts researching belugas, and would attract a high attendance of relevant experts
- External funding would be sought to support attendees internationally as well as from within Russia, and an organising committee has already been established
- A scientific report would be produced after the event, to be published online together with presented scientific papers in the free access NAMMCO Scientific Publications Series site at http://septentrio.uit.no/index.php/NAMMCOSP/index

The Council of the Marine Mammals was agreeable to the proposal and will cooperate with NAMMCO on this event. An international Steering Committee has already been set up.

Disturbance Symposium
Planning for a Disturbance Symposium that will deal with the impacts of human disturbance on narwhal, beluga and walrus is underway. Preliminary plans are to hold the meeting in early October 2015 in Copenhagen. Kit Kovacs has agreed to Chair the meeting and Mads Peter Heide-Jørgensen is the NAMMCO Convenor.

The primary objectives of the Symposium will be to 1) present an overview of the information currently available, and 2) make recommendations for both restrictions of anthropogenic disturbances and future studies. The conclusions will be available to stakeholders shortly after the meeting in the form of a report with specific recommendations. Participants may also be invited to submit papers stemming from the symposium for publication in a special volume of the *NAMMCO Scientific Publications* series.

The **SC recommended** broadening the scope of the Symposium to include presentations from other species/research. A number of external experts will be required for this meeting.

SURVEY PLANNING

Overview of plans and resources by jurisdiction
The proposed Iceland governmental budget includes 8.5 mill NOK, corresponding to ¾ of the required amount in the MRI T-NASS2015 proposal (including National Surveys and Extension survey), leaving ¼ unfunded. The Faroe Islands Fishery Ministry has put 1.81 mil NOK in the proposed governmental budget for a ship-based survey, and also included an additional 1.13 mill NOK for the extension survey. Greenland has applied for the funding for their National surveys through the Greenland Institute of Natural Resources and an additional 1.02 mill NOK has been included in the Greenland Government budget as a contribution to the Extension survey. Norwegian national surveys through the IMR would cover the EW *Small Area* (IWC terminology) which includes the Norwegian Sea from the coastline to 3°E in the northern part and around Faroe Islands in the south. The SC was unable to get confirmation on whether the Jan Mayen Extension area was included in the proposed Norwegian governmental budget (outside of the IMR budget) as Norway's contribution to the extension survey.

All of the proposed governmental budgets are yet to be approved.
One of three primary objectives for T-NASS2015 is to obtain a complete synoptic abundance estimate for minke whales in the central area of the North Atlantic. The **SC agreed** that it will not be able to achieve this objective if funding for the extension areas is not confirmed by early January 2015.

Shipboard surveys
Norwegian surveys will use the same methodology for both the *EW* small area and the Jan Mayen (*CM*) extension area as in previous surveys. Norway **stressed** that a condition to their contribution to the Jan Mayen Extension survey area is that the Norwegian IO method is fully implemented in the entire area.

The Norwegian survey methods use two symmetrical platforms with two sets of observers using cues as sighting units. The survey is conducted in passing mode. Sighting is done without binoculars, and it is important to have both platforms doing exactly the same thing.

The SC discussed that Svalbard was not included in the proposed T-NASS2015 area because it is included in the Norwegian mosaic survey. This area was last surveyed in 2014.

In Iceland the plan is to use 2 or 3 survey vessels: one would also be doing a mackerel survey and cover the Icelandic economic zone including roughly 1/3 of the Jan Mayen extension survey area. Mackerel surveys stop to trawl for about an hour 2 to 3 times during the day, therefore it seems acceptable to use this platform for cetacean surveys.

The Icelandic survey plans to use 2 symmetrical platforms, and will use binoculars to some degree. Cue count data will be collected and it will be investigated whether the Norwegian analysis method can be used, or else a conventional cue count analysis will be used. The mackerel vessel would not be able to close, so they will survey in passing mode. The other vessels will survey in delayed closing mode, but will not close on minke

whales. Fin whales frequently overlap with sei and blue whales and can easily be confused, therefore species ID is particularly important for the Icelandic surveys justifying the use of binoculars and delayed closing mode.

The Faroe Islands will be using both a dedicated survey vessel, and if feasible, a mackerel survey vessel. The dedicated survey vessel will operate with double platform IO mode and in delayed closing mode using standard line transect. The Faroese plan to measure noise on vessels to determine whether they can use acoustics.

A primary question is how to obtain reliable group size estimates for pilot whale groups. It was agreed that drones and helikites should be tested in the Faroes as a method of obtaining independent group size estimates of pilot whales.

Russian redfish surveys in the Irminger Sea in June/July 2015 will include dedicated cetacean observers.

Aerial Surveys
Greenland will fly the Twin Otter and plans to use the same protocols as previous surveys, including a full double platform setup, and allowing for cue counting, strip census, and line transect estimation if needed. Availability of whales at the surface will be estimated from dive data recorders.

Iceland will fly the Partenavia in coastal areas and will use the same protocols as previous surveys, with a partial double platform setup, data collected in cue counting mode for minke whales, and standard line transect for other species. Iceland plans to add either a still or video camera to assist the IO platform and distance and group size estimation.

Observers, Data collection and Equipment needs
It was considered mandatory for the success of the survey that initial testing of drones and recording systems should be started as soon as possible. The **SC recommended** that available funds from the SC should be spent on acquiring these pieces of equipment.

Other pieces of equipment needed for the surveys can be acquired during spring 2015 under the national budgets, or money budgeted in the SC for survey coordination.

Observer candidates should be contacted soon to ensure availability for the survey. It is also important that cruise leaders and observers and trained before the survey.

The T-NASS Steering Committee will keep in contact for the next 6 months and meet if necessary to ensure adequate planning and execution of the surveys.

NAMMCO Scientific Publications
All papers in Volume 9: *Walrus of the North Atlantic* have now been published online. The hard copy is now in the process of being typeset by the publishers (Bokstavhuset in Tromsø). The hope is that the printing will take place before the end of 2014, but by the end of January 2015 at the latest. The SC noted that Volume 9 will be the last volume printed as a hard copy. There are now four papers in Volume 10: *Age estimation of marine mammals with a focus on monodontids* that have been published online, and a few more are nearing completion.

The SC discussed whether to keep the *NAMMCO Scientific Publications* as themed volumes, or open the journal up to rolling submissions. The SC recommends that this issue is discussed with Editorial Board, especially since this could increase the workload of the Board members, whereas the themed volumes have scientific editors that take on the majority of the editorial work.

Work procedures in the SC
The SC **recommends** again that ROP should be amended to allow more than 3 members from each country at the meeting. Each country would still only have one vote.

Stock Status List Update
The Stock Status List website was presented to the SC, who welcomed this work. The website has been designed so that it will be easy to update with new information, and will be updated regularly by the Secretariat.

MAIN REPORT

1. CHAIRMAN'S WELCOME AND OPENING REMARKS

The Scientific Committee (SC) Chair Gunnlaugsson opened the 21st meeting of the NAMMCO SC. He welcomed the NAMMCO Scientific Committee members, as well as the observers from Japan and the Russian Federation (Appendix 3), and extended thanks to Nils Øien and the Institute of Marine Research (IMR) in Bergen, Norway for hosting the meeting.

2. ADOPTION OF AGENDA

The draft agenda was adopted with minor amendments (Appendix 1). Under item 6.1 a separate item (6.1.1 By-catch) was added. All items in 6.5 (T-NASS2015) were moved to Item 9. Blue whales were added to the agenda (item 8.14).

3. APPOINTMENT OF RAPPORTEUR

Prewitt (Scientific Secretary) was nominated as rapporteur, with the help of Lockyer (General Secretary) and Winsnes (Deputy Secretary) and the participants as needed.

4. REVIEW OF AVAILABLE DOCUMENTS AND REPORTS

The documents available at the meeting are listed in Appendix 2.

4.1. National Progress Reports [SC/21/NPR-F, -G, -I, -N, -C, -J, -R]

Progress reports for 2014 were received from Norway, Iceland, the Faroe Islands, and observer countries Canada, Russian Federation and Japan. The Greenlandic NPR was not received in time for consideration at the meeting. Observer countries were thanked for their reports.

Zabavnikov presented an overview of research conducted by PINRO North Atlantic Laboratory in the North Atlantic, Barents, Kara and White Seas.

Kitakado presented a summary of marine mammal research conducted in Japan.

4.2. Working Group Reports [SC/21/07, SC/21/13]

Reports from the T-NASS2015 Steering Committee meeting (SC/21/14), the Survey Planning Working Group (SC/21/13), and a summary of the NAMMCO-JCNB SC WG on Narwhal & Beluga Catch Allocation Sub-group Meeting report (SC/21/07) were available.

5. COOPERATION WITH OTHER ORGANISATIONS

Observer reports from meetings of other organisations were available for consideration and are available in Appendix 4.

5.1. IWC [SC/21/05]

Walløe presented a summary of the 65th (b) Meeting of the International Whaling Commission Scientific Committee was held in Bled, Slovenia from 12-24 May 2014. Pre-meetings starting on the 9th (North Atlantic common minke whales).

The full observer's report is available in Appendix 4.

Of particular interest to NAMMCO, for the North Atlantic common minke whales, there was a pre-meeting (Working Group - WG) in Copenhagen, chaired by Greg Donovan (IWC Secretariat) in April 2014 when population structure was discussed using new genetic data from 2004 and 2007–2011. The data now indicate only one population across the whole of the North Atlantic, but there is the possibility of adopting several population situations in the simulation implementation trials. Simulations are the core of the implementation

procedure. Three populations are up for consideration, but for Norway and Iceland, if 3 "medium areas" are assumed, the number of management "small areas" will be reduced.

From surveys of common minke whales in the period 2008-2013, a population size of 94,000 has been estimated compared with 108,000 from an earlier period. This decrease is due to fewer whales in the Jan Mayen (Central stock) area while the population in the eastern area has not changed during the previous 6 yr. This new estimate can be used in the simulation trials. The Norwegian scientists explained that the existing method is robust, but the WG wanted to see a comparison between old and new methods. Data from the previous survey period 1996-2001 used before the 2005 meeting, should also be used along with that from the 2008-2013 survey period.

Walløe – the leader of the steering group – will work inter-sessionally on the Implementation Review and also hold a meeting. During the actual IWC SC meeting, it was proposed to change the simulation programme to be used in the simulation trials and use a light version of RMP03. The plan is to finalise the Implementation review in the next SC meeting (2015).

Regarding the Aboriginal Whaling Management Procedure (AWMP), Greenlandic catches of bowhead and humpback whales were of concern. In West Greenland, the strike limit of 2 bowheads was deemed sustainable for the population (as previously), and an annual strike of 10 humpback whales. For other species, a strike limit of 19 for fin whales was accepted and for common minke whales there was a strike limit of 164. In East Greenland, the strike limit for common minke whales was 12.

Discussion by the NAMMCO SC

Víkingsson informed that work continued on the Implementation review on North Atlantic fin whales. Given the complexity of the trials, it had not been possible to complete conditioning successfully during the workshop. The IWC SC developed a work plan with the objective of finishing the Implementation Review at the 2015.

The SC of NAMMCO recognizes that the NAMMCO Large Whale Assessment should await the work of the IWC on minke and fin whales to be completed in 2015.

5.2. ASCOBANS [SC/21/06]

Desportes presented an observer report from the 21st ASCOBANS Advisory Committee meeting in Gothenburg, Sweden, 29 September – 1 October 2014. The full observer report is available in Appendix 4.

Discussion by the NAMMCO SC

One issue of note from the report was ASCOBANS' plan to write to the EU regarding the Faroese pilot whale hunt. The SC and Secretariat did not know if this letter had been written at the time of the SC meeting. These issues are usually handled by the Ministry of Foreign Affairs. The Secretariat informed the SC that they had received a letter from the UK regarding the Faroese hunts around the time of the ASCOBANS meeting. The situation is worth monitoring, especially considering what has happened with the EU seal ban.

The SC discussed the level of cooperation between NAMMCO and ASCOBANS. Formally NAMMCO and ASCOBANS have an official agreement for exchange of observers.

The SC recommended that the NAMMCO Secretariat request harbour porpoise by-catch numbers for the North Sea from ASCOBANS, when needed for future assessments/WGs.

5.3. ICES [SC/21/04]

Haug reviewed the 2013 and 2014 activities in ICES, which have some relevance to the work in the NAMMCO SC. The full observer report is available in Appendix 4. This included work in the ICES Working Group on Marine Mammal Ecology (WGMME) and the Working Group on By-catch of Protected Species (WGBYC). The ICES Annual Science Conference (ASC) generally include sessions with marine mammals included as an integral part, occasionally (including the 2014 meeting) also sessions entirely devoted to marine mammals.

5.3.1. Request to ICES for NAMMCO to join WGHARP

Prewitt informed the SC that a request for NAMMCO to join the WGHARP was sent from the NAMMCO Secretariat to the ICES Secretariat in August 2014. The Secretariat is awaiting a response, hopefully after the upcoming WGHARP meeting (two weeks after the SC meeting, November 2014, Quebec City, Canada).

5.4. JCNB [SC/21/07]

A sub-group of the NAMMCO-JCNB Joint Scientific Working Group met on 10–12 March 2014 in Copenhagen to develop a model for narwhal catch allocation. A summary of the report was available at the SC meeting (ANNEX 1; see Item 8.6.2). The full report was not presented at this meeting because the model is not yet complete, and the SWG sub-group will meet again in March 2015 to finalize the model.

The full Scientific Working Group will also meet in March 2015 in Ottawa, Canada, directly after the sub-group meeting.

5.5. Other

No other outside groups were reported to the SC.

6. ENVIRONMENTAL / ECOSYSTEM ISSUES

6.1. Marine mammals-fisheries interactions

With regards to **R-1.1.2** (fisheries interactions in the Davis Strait ecosystem), tagging studies have shown that harp seals use a huge area including waters off southeast Greenland, in Baffin Bay and adjacent waters. The number of seals that forage in the Davis Strait varies with season and the catch statistics along the coast indicate that there also might be significant annual variation in their distribution. The cod and the shrimp stocks have also varied in size and distribution and other components in the ecosystem might also be important. In other words: A study that can provide a reliable answer to "How harp seals influence the shrimp and cod stocks in Davis Strait" need to be a large scale monitoring programme that can produce a time-series not only on abundance and foraging behaviour of harp seals and cod, but also of other keystone species and of the physical environment. In 2001 The Greenland Institute of Natural Resources held a workshop "Ecosystem West Greenland - a stepping stone towards an integrated marine research program" in order to identify keystone species and to discuss how such a programme could be initiated. The large-scale programme was never implemented, but some minor components have been conducted. Financial commitment for a large-scale monitoring programme has not been available. The SC now considers this request as **outdated**.

In regards to **R-1.1.3** (impact of marine mammals on the ecosystem, especially economically important fish species), the first discussions revealed that there were too many unknowns to make such an assessment. The working group was therefore given the task to identify important gaps in our knowledge. A second part of the assessment would be to develop a model. It was therefore decided that four different models should be tried out using data from the most data-rich areas. The SC noted that this request is very similar to R-1.1.5 suggested that R-1.1.3 be **replaced** by R-1.1.5.

The SC recommends that **R-1.1.5** (interactions between marine mammals and commercially exploited marine resources) should **remain as a standing request** and also takes the place of R-1.1.3.

R- 1.1.8 (ecosystem modelling and marine mammal fisheries interactions): This request should **remain ongoing** until the results expected from Iceland are presented in the SC.

Haug reported from recent Norwegian research on the ecology of killer whales in the Norwegian Sea (Nøttestad *et al.* 2014). The traditional perception of prey species preference of killer whales in the Northeast Atlantic has, to a large extent, been linked to herring. Few studies have investigated the feeding ecology of killer whales from the offshore parts of this ecosystem. During two summer-season ecosystem-based surveys in the Norwegian Sea (2006 and 2007), using observational, acoustic, oceanographic, plankton net, and pelagic trawl haul data, it was possible to quantify any spatial overlap between killer whales and the three most common and abundant pelagic fish species: herring, mackerel and blue whiting. No spatial relationships were found between killer whales and herring or blue whiting. However, there was a significant relationship and spatial overlap between killer whales and mackerel. Feeding on this epipelagic schooling fish species during summer may incur lower migration costs and higher energetic gain than feeding on alternative prey. Killer

whale group size was also correlated to the size of mackerel trawl catches, indicating active group size adjustment to available prey concentrations.

Future work

Haug and Zabavnikov reported that a high priority part of the planned Joint Norwegian-Russian Research Program on Harp Seal Ecology is to deploy satellite transmitters on harp seals in the White Sea. In all the years 2007–2011 it was planned to do this in a joint Russian-Norwegian effort just after the moulting period (in late May), or, alternatively, in late March–early April if ice conditions turns out to be unfavourable in early May. Unfortunately, the Federal Technical Committee (FTC) did not permit satellite tagging using non-Russian tags in Russian waters in all years. In 2012–2014, however, permission to tag harp seals in the White Sea was given by the Russian Authorities, but now a lack of funding prevented tagging of seals. Application for funding has now been submitted to the Norwegian Research Council, and if successful, an attempt to do the tagging will be done in 2015. During the tagging experiment, PINRO will provide the necessary logistics required for helicopter- or boat-based live catch of seals in April–May 2015. The Institute of Marine Research, Norway, will, as before, be responsible for the satellite tags, including providing all necessary technical details, as well as for providing experienced personnel and equipment for anaesthetizing seals and tag deployment. For proper planning and budgeting on both institutes, a PINRO scientist must obtain the necessary permissions from Russian authorities before December 2014. The permission from Russian authorities is not dependent on the origin of the transmitters; both US and Russian transmitters can be used. The transmitters cannot collect geographically positioned temperature and salinity data.

6.1.1 By-catch

Gunnlaugsson presented SC/21/11 which reports on by-catch of seabirds and marine mammals in Icelandic waters net fisheries, including bottom set lumpsucker nets and cod gill nets. In Iceland it is mandatory to report all by-catch, but records for other gear are few, also in Marine Research Institute (MRI) trawl surveys where all by-catch is registered. Main sources of information are the annual cod gill net survey, conducted in April where routine recording of marine mammals started in 2002. Survey effort is about 2% of the fleet effort in April and is distributed in line with the fleet effort by area. Some reporting of marine mammals in the bottom set gill net fishery started in early 2002 or about 5% of the cod gill net fleet up to 2009 when a new electronic log-book system was implemented. No records have been received from the new system. Cod gill net fishery by-catch was estimated by assuming that the mean by-catch per net in the survey was the same as in the fishery 2002–2008. For other species their observed proportion in the cod fishery to porpoise is used to estimate numbers based on the porpoise by-catch estimate.

Lumpsucker effort in the period 1980–2013 was higher in the earlier years 1980–1997, with about 440 thousand net hauls annually. Effort decreased at the turn of the century to about 180 thousand, but increased again in 2009–2012 to just over 300 thousand. All by-catch reports from 2011-2014 have been entered in the database, but in 2013 and 2014, records with zero by-catch were not entered, because of a discrepancy between the handwritten data sheets and the entry programme. In 2011, 10–20% of the boats are missing as they changed over to the electronic log-book and encountered problems, but much less for 2012 as they changed back to handwritten reports. Only a part of the fleet has recorded marine mammals.

Directorate of Fisheries inspectors and MRI staff collecting samples for biological research have reported by-catches and these records are available since 2010, but it is not possible to state whether inspectors or researchers observed or recorded all by-catch. These data were compared to log-book records from the lumpsucker fleet to estimate the proportion of by-catch reported for the years 2011–2013. In 2014 inspectors specifically checked the records of the fishermen and urged them to fill in unreported catches and the proportion of vessels reporting is then much higher on these boats, therefore it is not possible to assume that the inspection did not influence the log-book recording then.

The harbour porpoise is the most commonly by-caught marine mammal, representing 73% in the gill net fishery and 79% in the survey, but 48% in the lumpsucker fishery. Survey records are of 4–18 animals in 2002–2007, but 12-68 animals in 2008-2014. There is some question whether the survey data are complete in the first years, but participants then claim that the data are reliable, as supported by no increase in other by-catch (excluding harp seals).

According to the calculations the porpoise by-catch in gill nets has decreased since 2003, from 7,300 animals

to about 1,600 animals in 2009–2013, in line with the decreased effort in the cod net fishery. With 400 porpoises taken in lumpsucker nets, the total has likely been about 2,000 animals from 2009. This is 1.2–6.5% of the abundance estimate range calculated from the 2007 aerial survey and may exceed the precautionary reference point usually used for harbour porpoise (1.7%). If, however, the recent increase seen in the net survey numbers is factual and reflects an increase in the stock due to the reduced net fishery effort, then the replacement potential must be much higher than 1.7%. Porpoises occur also in deep waters outside the aerial survey range. Animals tagged off the West Greenland coast (Nielsen *et al*. 2013) spent most of their time in deep waters. Surveys in deep waters target large whales, but porpoises are hard to detect and no estimates exist there. It is likely the abundance based on the aerial survey is also severely underestimated. Genetic mark-recapture analyses are ongoing and may result in a new estimate of abundance.

Harbour seal is the second most commonly by-caught marine mammal in both cod nets (21%) and lumpsucker nets (37%), with an estimated by-catch of 705 animals for 2013. The stock estimate from the 2011 aerial survey was 11,000 animals and the 2013 by-catch is 4–8% of this stock size range. In 2010 the management objective was defined to aim at keeping the stock above the 2006 level when it was estimated 12,000 animals, and was therefore just below this limit in the last count in 2011.

Grey seal is the third most commonly by-caught marine mammal in lumpsucker nets (18%), but is much rarer in gill nets, with a total by-catch estimated at 140 animals for 2013. The aerial abundance estimate in 2012 was 4,200 and the 2013 by-catch is 2-3% of this stock size range. In 2005 a management objective was defined where the aim is to maintain the stock above the 2004 estimated abundance of 4,100 animals. The stock is now just above this limit.

The vagrant harp seal comes second in the net survey (12%). The first 2 by-caught seals were recorded in 2008 and the highest 28 in 2009, but is rare in the lumpsucker fishery. Other species of marine mammals are rare as by-catch.

The lumpsucker net by-catch calculations for 2013 hinge on the assumption that the presence of observers had no influence in the log-book reporting of the fishermen, but there are signs that this is not fully true. The estimated lumpsucker fishery by-catch for 2014 of grey and harbour seals and some other species, obtained by multiplying up the records from inspectors, is higher than in 2013, in line with an increase in log-book records then. Other approaches at estimating porpoise and seal by-catch from these data gave both higher and lower numbers.

No attempt was made to estimate the precision in the estimates, but they are generally based on small numbers. Survey data will continue to accumulate, but are collected only during about 2 weeks in the spring. Extrapolation from the survey data to the whole area and all months is based on outdated records from the fishery 2002-2008.
Earlier estimates of porpoise by-catch based on questionnaires (Ólafsdóttir 2010), were considerably lower than those presented here. This supports the conclusion by Ólafsdottir that self-reporting is unreliable for estimating total by-catch.

Discussion by the NAMMCO SC
The SC noted that the estimates of harbour porpoise by-catch in this report are using similar extrapolations to Bjørge *et al.* (2013).

The SC discussed the reduction in effort in the gillnet cod fishery, mainly due to the fishery having moved to trawling and line. Trawl surveys in Iceland have not shown significant by-catch. This is similar to other areas in Europe where there is little to no by-catch of seals and harbour porpoises in trawls (except for the bass trawl fishery). Norway noted that they have video recording from trawls where harp seals are seen entering the trawl, eating, and then exiting safely.

In Norway, the monkfish fishery that uses gill nets is a serious issue for marine mammals (Bjørge *et al*. 2013). IMR receives by-catch data via the research reference fleet. There is also mandatory by-catch reporting in all fisheries in Norway, but the Directorate of Fisheries seems not to receive any reports of by-caught marine mammals. Gunnlaugsson noted that there is some monkfish fishing in Iceland, but no records of by-catch in

this fishery. In Iceland, the effort in the lumpsucker fishery has been reduced in recent years through shorter time periods and fewer nets allowed.

The SC **welcomes** these by-catch estimates from Iceland, and the previous data from Norway on harbour porpoise. It notes that the lack of by-catch recording in the gill net fishery from the log-book system implemented in 2009 in Iceland is of great concern. A functioning by-catch recording system is of highest priority. The uncertainty on reporting of by-catches in other gear such as monkfish nets should be given priority by fisheries inspectors. The SC noted that the Harbour Porpoise Working Group (HPWG) may want to review the data from Iceland to consider whether there are better methods of monitoring the by-catch. The 2013 HPWG considered the by-catch issue from Norway, including suggestions for mitigation. The SC noted that a future HPWG meeting requires information on by-catch before the assessment can continue.

With this new information on by-catch, the SC **recommended** convening a By-catch Working Group (WG). This would be a technical WG that could focus on discussing the methods that are being used to collect the data and extrapolate the results, and decide if further work is required.

Prior to a By-catch WG meeting, it will be important to have the by-catch numbers from the reference fleet in Norway, but also to compile the necessary fisheries data. These data would need to come primarily from management agencies, and includes fishery effort data (both spatial and temporal) from all fisheries, but most specifically net fisheries.

Suggested Terms of Reference:

By including external expertise from fisheries and marine mammal science, the WG would

1. Identify all fisheries with potential by-catch of marine mammals.
2. Review and evaluate current by-catch estimates for marine mammals in NAMMCO countries.
3. If necessary, provide advice on improved data collection and estimation methods to obtain best estimates of total by-catch over time.

The SC **noted** that the outcomes from the By-catch Working Group should be considered by the Coastal Seals WG (CSWG). The SC **suggested** that the CSWG be postponed until 2016 (see item 7.4.3.1), and that the By-catch WG could meet just prior to the CSWG.

6.2. Multispecies approaches to management

R-1.2.1 (developing multispecies models for the North Atlantic): This remains an **ongoing request**. A large-scale ecosystem modelling project (MAREFRAME) is underway, which includes marine mammals in Icelandic and adjacent waters.

R-1.2.2 (monitor stock levels and trends in stocks of all marine mammals in the North Atlantic): This remains a standing request.

6.3. Economic aspects of marine mammal-fisheries interactions

R-1.4.1-1.4.6: This series of requests are all regarding the economic aspects of marine mammals-fisheries interactions. The SC regards these requests as **outdated** and if the Management Committee would still like these issues addressed, a new, more specific request should be drafted. The SC also noted that socioeconomic impacts are included in a large-scale ecosystem modelling project (MAREFRAME) which includes marine mammals in Icelandic and adjacent waters.

6.4. Environmental issues [SC/21/O04]

In regards to **R-1.5.1** (radioactive material entering the North Atlantic ecosystem), the SC considers this request **outdated**.

Haug presented a report addressing questions whether ice breeding seals can adapt to habitat loss in a time of climate change (Stenson and Hammill 2014). Harp seals require stable ice for pupping, nursing and the first weeks after weaning when the young develop the capacity to swim and feed. Although ice conditions in the Northwest Atlantic have varied over the past 40 years, in 2010 and 2011, the total extent of ice suitable for

whelping harp seals was at, or near, the lowest ever recorded. These years of exceptionally poor ice yielded an opportunity to improve the understanding about how ice breeding seals may respond to the conditions expected in the future. Harp seals responded to poor ice conditions differently, depending on the presence or absence of ice at the beginning of the pupping period. If no ice was present, females moved away from their traditional whelping areas to find suitable ice. If small amounts of ice were present, females gave birth even if the ice was too thin to sustain the pups, resulting in high pup mortality. There was no evidence to indicate that harp seals pupped on land even in areas where ice was absent. Young seals that drifted to shore had high levels of abandonment and mortality. If the predicted warming trends continue, ice-breeding harp seals will encounter more years with poor ice conditions and may eventually adapt by moving to alternative areas. Until then, they will continue to have increased levels of mortality.

Lydersen presented a paper on the importance of glaciers to marine mammals (Lydersen *et al.* 2014). Approximately 60% of Svalbard's land areas are glaciated at the present time. The Archipelago has more than 1,100 glaciers (> 1 km^2) and 163 of these are "tidewater glaciers" – that is glaciers that terminate (with their calving front) at the sea. It has been known for a long time that these glacier front areas are important feeding areas for seabirds and marine mammals. Recent satellite tracking studies have shown that many of Svalbard's ringed seals spend the whole year in front of various glacier fronts, and white whales have been shown to spend about 55% of their time during summer and autumn at these sites. Prime breeding habitat for ringed seals in Svalbard occurs deep in the fjords where ice pieces calved from the glacier fronts become frozen into land-fast sea-ice, promoting the accumulation of snow to a depth suitable for ringed seal females to dig out birth lairs above breathing holes in the ice. These pupping areas are important hunting areas for polar bears in spring, especially female bears with cubs of the year during the period following emergence from the winter/birthing den. Glacier-ice pieces floating in coastal areas are also important for all seal species in the region as dry platforms during moulting and also as general resting platforms for both birds and seals. During the last decade there have been several years with a complete lack of spring sea ice in many of the fjords along the west coast of Spitsbergen. During the spring periods in these years, bearded seals have replaced their regular sea-ice platform with glacier ice, using it as a solid substrate for both birthing and nursing as well as general resting. The mechanisms that create foraging hotspots at the fronts of tidewater glaciers are related to the massive subsurface plumes of freshwater discharged from the glacier fronts. As these plumes rise towards the surface they entrain large volumes of ambient water, tens to hundreds of times the original discharge volume. This water is drawn from all depth levels as the plume ascends. This entrainment ensures a continuous resupply of intermediate depth waters from the outer parts of the fjords towards the glacier front and greatly amplifies the general estuarine circulation. The intermediate water masses carry plankton from a broad area, including the outer fjord, into the glacier front area, where they get entrained in the plume rising towards the surface, and often become stunned or die from freshwater osmotic shock. These small animals fall easy prey to the surface feeding predators. Large, strong swimming marine zooplankton species can sometimes escape by swimming below the inflow of marine water. But, they then become concentrated in a water layer near the bottom, making them of interest and susceptible to predators. Currently, the mass balance for Svalbard glaciers is negative and climate change predictions for the future suggest continued warming, and hence continued glacial retreat. This will result in a reduction in both the number of glaciers calving into the ocean in Svalbard, and also a reduction in the total length of calving fronts around the Archipelago. Similar to the retraction of the northern sea-ice edge (which is another diminishing foraging hot-spot for these same arctic vertebrates), the climate-warming-induced changes in glaciers will likely lead to substantial distributional shifts and abundance reductions for many arctic species.

Lydersen also presented Reeves *et al.* 2014. This paper summarizes information on the distribution and movement patterns of the three ice-associated cetacean species that reside year-round in the Arctic: the narwhal, the beluga and bowhead whale. It maps their current distribution and identifies areas of seasonal aggregation, particularly focusing on high-density occurrences during the summer. Sites of oil and gas exploration and development and routes used for commercial shipping in the Arctic are compared with the distribution patterns of the whales, with the aim of highlighting areas of special concern for conservation. Measures that should be considered to mitigate the impacts of human activities on these Arctic whales and the aboriginal people who depend on them for subsistence include: careful planning of ship traffic lanes (re-routing if necessary) and ship speed restrictions; temporal or spatial closures of specified areas (e.g. where critical processes for whales such as calving, calf rearing, resting, or intense feeding take place) to specific types of industrial activity; strict regulation of seismic surveys and other sources of loud underwater noise; and

close and sustained monitoring of whale populations in order to track their responses to environmental disturbance.

6.5. Monitoring marine mammal stock levels and trends in stocks / North Atlantic Sightings Surveys (NASS)

R-1.7.11: (abundance estimates from TNASS-2007 data): This request is **ongoing**.

R-1.7.12 is a **new request** from NAMMCO 22 from Greenland: "Greenland requests the SC to give information on sustainable yield based on new abundance estimates expected from TNASS2015 for all large baleen whales in West Greenland waters (NAMMCO 22)."

The SC **noted** this new request, and will consider this again after T-NASS2015.

6.6. Other

R-1.8.1 (need for greater input from hunters in the work of the SC) and **R-1.8.2** (SC report language must be kept precise and simple): These are now part of the SC working procedures, and suggest that the request is now **outdated**.

7. SEALS AND WALRUS STOCKS - STATUS AND ADVICE TO THE COUNCIL

7.1. Harp Seal

7.1.1. Review of active requests

R-2.1.4 (regularly update stock status of harp and hooded seals): This request will remain as **standing**.

R-2.1.6 (evaluate how a projected decrease in the total population of Northwest Atlantic harp seals might affect the proportion of animals summering in Greenland): This request is now considered **completed**, and the SC will await a new request from Council if needed.

R-2.1.9 (decline in Greenland stock of hooded seals): **Ongoing**

R-2.1.10 (advice on total allowable catch of harp seals): **Standing**

R-2.1.11 (effect of decreasing populations of harp seals in North Atlantic impacts summering seals in Greenland): The SC now considers this request as **completed**.

7.1.2. Update

Pup production in the White Sea

Zabavnikov and Haug reported that aerial surveys had been carried out by PINRO in 2013 to estimate pup production in the White Sea using the same multispectral methods as used in previous surveys. Six survey flights (15, 16, 17, 18, 20 and 21 March 2013) with a total duration of 31.5 hours were completed. Over 7,000 km^2 were covered by the surveys. The first 5 surveys provided complete coverage of the area. The survey on 21 March provided a second independent coverage of the area where pupping occurred. Ice conditions in 2013 were typical, corresponding to long-term average ice conditions. More than 16,000 digital photos and over 200 Gb of thermal images were obtained of the White Sea ice coverage and harp seal whelping patches. These data have now been processed in detail. The final result of the 2013 survey yielded a total pup production number of the White Sea/Barents Sea harp seal population of 128,786 (CV=0.237).

Use of drones in pup production surveys

Haug further reported from a new project aimed to renew the methods used in aerial surveys to estimate harp and hooded seal pup production (Nilssen *et al.* 2014). Thus, with funding from the Norwegian Research Council (NRC), IMR has now started experiments with alternative (and cheaper) methods to perform photo-based aerial surveys of seals in the West Ice. A research survey was conducted with KV "Svalbard" to the West Ice during 16 to 26 March 2014. The aim of the survey was to test the usefulness of UAVs (Unmanned Aerial Vehicles), operated by the Northern Research Institute (Norut), to perform aerial photographic surveys of harp and hooded seal whelping patches on the drift ice. Two drones were tested: One small (wingspan 2.10 m) with electromotor and one larger (wingspan 3.80 m) petrol-driven UAV. Digital cameras were used, and the largest UAV was also instrumented with thermal infrared (IR) camera. Both aircrafts were launched by a mechanical launcher from the ship deck. The smaller UAV could be landed on KV Svalbard's helicopter

platform, while the larger had to be landed on ice floes, preferably at least 80 m long and 20 m wide. Both UAVs fly along predefined transects and altitudes, both can be changes throughout the flight using satellite based communication. The UAVs are landed manually. The main aim of the pilot investigations in 2014 was to explore various survey altitudes and camera settings to obtain an optimal altitude and camera set up for photographing seal pups. Simultaneous use of digital and IR cameras enabled exploration of combinations of those to detect and classify seals. Experience obtained from using the UAVs and the quality of the images taken, are promising. Both harp and hooded seals, including pups, were easily identified on the images taken at a flight altitude of 300 m (the usual altitude for photographing during traditional surveys). Also preliminary results from the IR camera are promising. It is, however, necessary to improve the range of the largest UAV and the methods for landing the aircraft on ice floes. Also some technical improvements on both aircrafts and operational equipment should be performed. A new survey, building on the experience gained in 2014, will be conducted in the West Ice in 2015.

Status of Northwest Atlantic harp seals

Haug reported that photographic and visual aerial surveys had been conducted off Newfoundland and in the southern Gulf of St. Lawrence to determine pup production of Northwest Atlantic harp seals in 2012 (Stenson *et al.* 2014). The survey resulted in an estimated total pup production of 790,000 (SE=69,700, CV=0.088). This estimate is approximately half of the estimated number of pups born in 2008, likely due to lower reproductive rates in 2012 compared to 2008. Only 15% of the pups were born in the southern Gulf where years of poor ice conditions have been increasing in frequency over the past decade. Ice conditions observed during 2012, were similar to those observed in 1969, 2010, and 2011 and are among the worst on record. This continuing trend of poor ice conditions has serious implications for survival of harp seal pups and the longer-term persistence of breeding seals in the southern Gulf of St Lawrence.

Haug further reported that a population model had been used to examine changes in the size of the total Northwest Atlantic harp seal population between 1952 and 2014 (Hammill *et al.* 2014). The model incorporated information on reproductive rates, reported removals, estimates of non-reported removals and losses through by-catch in other fisheries to determine the population trajectory. The model was fit to 12 estimates of pup production from 1952 to 2012, and to annual estimates of age-specific pregnancy rates between 1954 and 2013. Pup production declined throughout the 1960s reaching a minimum in 1971, and then increased to a maximum in 2008. The total population size in 2012 were estimated to be 7,445,000 (SE=698,000). The maximum estimated population size, N_{max}, was estimated to be 7.8 million animals in 2008. The population appears to be relatively stable, showing little change in abundance since the 2004 survey, although pup production has become highly variable among years. Data on age-specific pregnancy rates indicate that herd productivity has declined compared to the 1980s and early 1990s.

Discussion by the SC

The SC discussed that the carrying capacity used in the modelling might need to be reduced because it appears that there may be density dependence influenced drops in reproduction at a lower carrying capacity than is being used.

Haug also updated the SC that the seals hunts have previously been subsidized by the Norwegian government, however, this year's proposed national budget has taken subsidies out. It is unclear how this may affect future harp and hooded seal research in Norway.

7.1.3. Future work

No new advice on the harp seals were available, but Haug reported that the ICES Working Group on Harp and Hooded Seals will meet again in November 2014 in Quebec, Canada, to review the status and assess the catch potential of harp seals in the Barents Sea/White Sea and in the Northwest Atlantic.

7.2. Hooded seal

7.2.1. Review of active requests

R-2.1.9 (investigate decline of Greenland Sea stock of hooded seals): This request is **ongoing**.

7.2.2. Update

Telemetry studies on West Atlantic hooded seals have provided very detailed information on distribution and

diving patterns (Andersen *et al.* 2009, 2013a, b). The important feeding areas have also been identified using two different methods: a) based on how much time the seals spend in certain areas, and b) using drift dives (dives of sleeping seals drifting in the water column) to calculate weight gain in certain areas (Andersen *et al.* 2014). Their buoyancy during these drift dives can be estimated from the rate of decent and the daily changes in buoyancy can therefore be used as an index of feeding success, and this is found not always to overlap with areas where the spend most time.

7.2.3. Future work

No new advice was available for hooded seals, but Haug reported that the ICES Working Group on Harp and Hooded Seals will meet again in November 2014 in Quebec, Canada, to discuss hooded seals in the Northeast Atlantic.

7.3. Ringed seal

7.3.1. Review of active requests

R-2.3.1 (stock identity, abundance estimate, etc.): **Ongoing**

R-2.3.2 (effects of removals of ringed seals in Greenland): This request remains **ongoing**.

7.3.2. Update

Lydersen presented Kovacs (2013). The SC noted that the Arctic Council's working group "Conservation of Arctic Flora and Fauna" (CAFF) has a working group on ringed seals throughout the Arctic where a lot of important work is being presented, and includes suggestions for future monitoring on this species.

7.3.3. Future work

Rosing-Asvid noted that there are ongoing tagging studies in West Greenland, and genetics studies are planned for the near future.

7.3.3.1 *Possible WG*

At SC20, it was suggested that a Working Group be considered in the next few years (2015 or later), but that the CAFF report should be considered first. The SC **noted** that the CAFF group is likely a better forum than convening a NAMMCO WG, however the group was not sure if CAFF is planning more meetings.

The SC **reiterated** that data on this species is sparse and a full assessment is not possible. The SC **recommends** that a future WG should await results of ongoing tagging studies in central West Greenland, and future genetics studies to elucidate information on population structure.

7.4. Grey seal

7.4.1. Review of active requests

R-2.4.2 (abundance estimates all areas): **Ongoing**.

7.4.2. Update

Haug presented results from a new study on the global population structure and demographic history of grey seals. The analyses, conducted on samples from more than 1,500 individual seals collected from 22 colonies spanning the western and eastern Atlantic and the Baltic Sea, showed a high degree of genetic differentiation between the regions (Klimova *et al.* 2014). Highly asymmetric patterns of gene flow were inferred, with the Orkney Islands being identified as a source of emigrants to other areas of the eastern Atlantic. The Faroese grey seals are closely related to grey seals around the UK. The Baltic and eastern Atlantic regions were estimated to have diverged a little over 10,000 years ago, consistent with the last proposed isolation of the Baltic Sea. Identification was made of genetic signals consistent with postglacial population expansion across much of the species range, suggesting that grey seals are highly responsive to changes in habitat availability.

Haug further informed that the most recent pup production estimate of grey seals in Norway is based on data obtained in 2006–2008. The management plan for coastal seals now implemented in Norway require that data used in assessments should be updated every 5 years. A boat-based visual survey aimed to obtain a new abundance estimate for the species in Norway was, therefore, started in November 2013 (covering the northernmost parts of Norway) and continued in 2014 (covering parts of mid Norway). Some of the new estimates obtained in mid Norway were much lower than in the previous survey, and quotas were immediately

reduced in these areas as a result.

Mikkelsen informed that no survey has yet been conducted to estimate stock size, however there are plans to conduct a survey within the next few years. The Faroes have implemented a system to obtain numbers on removals from fish farmers (salmon), however they have not received data from all areas, and the statistics are not complete. Effort will be put into completing this work by next year.

Mikkelsen informed that low numbers of grey seals are known to be caught in the halibut fishery.

Updates are available in the Icelandic progress reports on grey and harbour seals. Grey seal pups were tagged with flipper tags during the pupping season in 2012 and 2013 in western Iceland. In addition, pups were counted and aged based on appearance and growth.

The SC noted a recent publication on the first record of grey seal in Greenland (Rosing-Asvid *et al.* 2010). Two grey seals were seen in S.E. Greenland in 2009. In 2010 a grey seal pup of the year was caught and tagged and the tag remained attached for one month. The seal travelled about 200 km up the East coast of Greenland. A survey along the S.E. coast in July 2014 did not find any grey seals.

7.4.3. Future work

The current surveys, aimed to obtain a new pup production estimate for the entire Norwegian coast, will be completed in 2015. If possible, Russia and Norway will conduct a joint survey of grey seals on the Murman Coast - these grey seal colonies have not been surveyed since 1991.

7.4.3.1 *Coastal Seals WG*

A Coastal Seals WG (CSWG; Chair: Kjell Tormod Nilssen) meeting has been tentatively scheduled for February 2016 to address R-2.4.2 and R-2.5.2. By February 2016, the CSWG will likely have by-catch estimates and a new complete grey seal estimate in Norway for consideration at the meeting.

The Terms of Reference for the meeting will be for the WG to:

1) assess the status of all populations, particularly using new abundance estimate data that are available from Iceland and Norway.

2) address by-catch issues (grey seals) in Norway, Iceland, and the Faroe Islands

3) re-evaluate the Norwegian management plans (which have been already implemented) for grey and harbour seals.

7.5. Harbour seal

7.5.1. Review of active requests (R-2.5.2)

R-2.4.2 and **2.5.2** (assessment of harbour seals in all areas): **ongoing**.

7.5.2. Update

Haug reported that aerial surveys aimed to obtain a new abundance estimate for harbour seals in Norway were started in 2011 and continued in 2012 and 2013. The survey results were supplemented with results from some boat-based visual surveys in 2014, resulting in a final point estimate of 7,533 for the species for the entire Norwegian coast. This new estimate has been implemented in the 2015 management of the species – this management now follows the management plan reviewed by NAMMCO SC in 2011.

The catch statistics from Norway do not include by-catch removals. Norway is now in the process of developing a model for management of harbour seals, which will include uncertainties around by-catch.

In Greenland, recent surveys searching for new haulouts have found three new colonies since 2009.

A comprehensive seal count was conducted in July 2013 in N.W. Iceland. The count resulted in 755 seals (mainly harbour seals) compared to 618 in the same area and time of the year in 2012.

In Iceland experiments were made with using drones for a survey this year. There are plans for full survey next year.

7.5.2.1. *Presentation from Japan*

Kitakado introduced his on-going works on stock assessment for the Kuril harbour seals in Cape Erimo, Hokkaido, Japan. The population experienced a severe decline between the 1940s and early 1970s due to heavy exploitation, and was protected from commercial harvests until now. Since then the population has been recovering gradually. The population was once on the red list in Japan as "Endangered" in 1998 but was downlisted to "Vulnerable" in 2012. Recently, damage to the fishery around the habitat has become serious, especially at some set nets for salmon fishery. Also, the non-negligible extent of by-catch of younger animals is of concern, and therefore the stock assessment and developing management procedures for this population are now regarded as urgent matters to take a balance between the fishery loss and population conservation. As an initial work, Kitakado and his colleagues have started analysis with an "age-aggregated production model" and an "age-structured models with density dependent reproduction". Both the models showed the population recovered around 70% of its carrying capacity although the depletion level depends on the assumption for detection probability of seals and their biological parameters. The current preliminary assessment showed it might be possible to cull adult animals which are big consumers of fishery products, to some extent, without causing an unacceptable level of risks should implementation of some mitigation measures to reduce the by-catch dramatically become successful.

7.5.3. Future work

Haug reported that biopsy sampling of tissue from pups for genetic studies will continue on the Norwegian coast in 2015. The aim of such sampling is to assess the population structure of the species using DNA analyses.

7.5.3.1 *Coastal Seals WG*

As discussed in 7.4.3.1, a Coastal Seals WG has been scheduled for late February 2016.

7.6. Bearded seal

7.6.1. Update

New tagging results for seals tagged in Svalbard are presented in (Lydersen *et al*. 2014), and this work is ongoing.

7.6.2. Future work

Bearded seal tagging in Svalbard and Greenland continues.

7.7. Walrus

7.7.1. Review of active requests (R-2.6.3)

R-2.6.3 (effects of disturbance on distribution, behaviour and conservation status): Ongoing

7.7.2. Update

Lydersen reported on a newly started project on walruses in Svalbard. This was a cooperation between Norway and Russia, mainly sponsored by the Norwegian-Russian Environmental Commission. This year 20 adult male walruses were instrumented with GPS loggers that should collect GPS positions for at least 5 years (1 position per hr). Data has to be downloaded to stationary or mobile receiving stations via VHF. Also blood and blubber samples were collected from these animals for various studies on pollution, diet and health assessments. Drugging in walruses is generally associated with high mortality risk. Here a new reversal (Naltrexone) combined with intubation and administration of pure oxygen resulted in zero mortality.

Lydersen further reported on the newly published results from the recent walrus survey in Svalbard (Kovacs *et al.* 2014). This was a photographic aerial survey flown in summer 2012, covering all current and historical haulout sites for walruses in Svalbard. It provides updates regarding the increasing numbers of: (1) land-based haulout sites (from 78 in 2006 to 91 in 2012); (2) occupied sites (from 17 in 2006 to 24 in the 2012 survey); (3) sites with mother-calf pairs (which increased from a single site with a single small calf in 2006 to 10 sites with a total of 57 small calves in 2012) and; (4) a 48% increase in abundance in the 6-year period between the two surveys to 3,886 (confidence interval 3,553-4,262) animals, including animals in the water at the time of the survey.

In addition, the camera surveillance of selected haulout sites in Svalbard continues, and Lydersen finally presented photographic evidence for a walrus killing a swimming reindeer.

There are three stocks of walruses that are hunted in Greenland and the assessment of quotas for the two stocks in West Greenland has been much debated. It was therefore decided by the Greenland Institute of Natural Resources that the northern stock (Baffin Bay stock in NW Greenland, Qaanaaq area) should be surveyed in April as a supplement to previous surveys that were conducted in May–June when the walruses are more dispersed in the North Water. The survey was completed in early April 2014 only covering the eastern coastal part of the North Water. The results were promising with more than 30 sightings and should allow for a new abundance estimate to be developed soon. Together with updated hunting statistics, this new abundance estimate could be used for a revised assessment for this particular stock with a possible update on advice. It was **suggested** that the Walrus Working Group (WWG) should resume for a one-day meeting in March 2015 to address the possibilities for updating advice on sustainable takes of walruses in the Baffin Bay stock. If feasible, the meeting could be conducted as a teleconference and participants would include Wiig (Chairman), Witting, Heide-Jørgensen, Hansen, Lydersen, Acquarone, Ugarte and Stewart.

Several walrus research projects are ongoing in the Pechora Sea around Dolgy Island which are sponsored by a Russian oil and gas company. This research is coordinated by the Russian public organization "Council of Marine Mammals" from Moscow.

7.7.2.1. *Review of recommendations from 2013 Walrus WG*

With regards to the recommendations made during the 2013 WG, there was no new information to report.

7.7.3. Future work

See above (7.7.2) regarding convening a one-day meeting of the WWG to update advice on sustainable takes of walruses in the Baffin Bay stock.

7.7.3.1 *Disturbance Symposium*

The planned Disturbance Symposium is discussed under narwhal and beluga.

8. CETACEANS STOCKS - STATUS AND ADVICE TO THE COUNCIL

8.1. Fin whale

8.1.1. Review of active requests (R-3.1.7)

R-3.1.7 (assessment of fin whales): This request is **ongoing**.

8.1.2. Update

The distribution of fin whale catches in Iceland in 2014 was very different from any previous whaling season since the resumption of whaling in 1948. Whale densities appeared to be very low on the traditional whaling grounds west of Iceland and the bulk of the total catch of 137 fin whales were taken south of Iceland. Preliminary analyses of stomach contents suggest that this changed distribution may be due to shortage of krill in the Irminger Sea.

In 2013 a fin whale/blue whale hybrid was caught in the Irminger Sea west of Iceland. This is the fifth confirmed hybrid between these two species in Icelandic waters.

Walløe updated the SC that concerns had been expressed about the lack of data for time to death in Iceland's fin whale hunt. In 2013 Icelandic authorities contracted Egil Øen to collect such data for the Icelandic fin whale fishery. Walløe will perform the statistical analysis, and the results will be submitted to NAMMCO before the Council meeting in February 2015. This will also be done for common minke whales.

8.1.3 Future work

See below regarding the Large Whale Assessment WG.

8.1.3.1 *Large Whale Assessment WG Fall 2015*

A Large Whale Assessment Working Group (LWAWG) meeting was previously planned for Fall 2014. This was postponed to Fall 2015, awaiting work to be completed by the IWC on the fin and minke whale *RMP Implementation Reviews*. The IWC SC has proposed a workshop in January 2015, and plans to complete this work by the IWC SC 66 a meeting in June. Therefore, the NAMMCO LWAWG will plan on meeting in the fall of 2015 in hopes that the work on the IWC SC will be complete.

8.2. Humpback whale
8.2.2. Review of active requests (R-3.2.4)
R-3.2.4 (formal **assessment): Remains pending.**

8.2.3. Update
The SC **noted** that IWC SC has accepted a strike limit algorithm for the Greenlandic humpback whale hunt.

8.2.4. Future work
Víkingsson informed the SC that a planned workshop for humpback whale researchers will be held in conjunction with the European Cetacean Society meeting in Spring 2015.

8.3. Sei whale
8.3.2. Review of active requests
R-3.5.3 (advice on status and minimum estimates of sustainable yield): This request remains **ongoing**.

8.3.3. Update
There were no updates for sei whales.

8.3.4. Future work
No future work was reported for sei whales.

8.4. Common minke whale
8.4.1 Review of active requests
R-3.3.4 (assessment): Response to this request is **pending** the conclusion of IWC Implementation Review (see above), and will be considered at the LWAWG planned for fall 2015.

8.4.2. Update
The SC **agreed** to use "common minke whale" as the common name for *Balaenoptera acutorostrata* going forward.

Attempts to collect time to death data for common minke whales in Icelandic waters were not successful due to the lack of catches during the planned observation period. During IWC's RMP Implementation Review of North Atlantic common minke whales extensive revisions were made on management areas in Icelandic and adjacent waters (see below). A satellite-tracking programme on common minke whales in Icelandic waters has provided the first indications of migration routes and winter destination of the species in the North Atlantic (Víkingsson and Heide-Jørgensen 2014).

Haug informed the SC about a recent study investigating the genetic structure of northeast Atlantic common minke whales. Several previous studies had investigated the population genetic structure within the north Atlantic minke whale with contrasting results. In order to shed further light on this topic, Quintela *et al.* (2014) conducted a spatial, temporal and cryptic population analysis of 2,990 whales harvested in the northeast Atlantic during the period 2004 and 2007–2011. This large data set, which had been genotyped according to strict protocols upon which the Norwegian minke whale DNA register is based, failed to reveal any indication of geographical or temporal population genetic structure within the northeast Atlantic based upon the analysis of 10 microsatellites and 331 bp of the mitochondrial D-loop. Furthermore, while three mtDNA lineages were revealed in the data, these did not show any underlying geographic pattern, and possibly represent an ancestral signal. The obtained results give no genetic support to maintain the 5 management areas in the northeast Atlantic. Anecdotally, north Atlantic common minke whales have been suggested to follow an annual migration cycle between Arctic feeding grounds and breeding grounds on lower latitudes. The information on sightings of common minke whales at low latitudes is, however very scarce and no breeding grounds have so far been demonstrated. Also, foetuses in different stages of development have been found in catches from the

northern feeding grounds, indicating that mating may take place even there and over a long period. The current suggestion of panmixia could therefore be supported by these observations, also implying that separate breeding grounds may not exist.

As a part of IWC's RMP Implementation Review extensive revisions of management areas have been agreed. These include large reductions in the number of management areas. Although the latest genetic evidence suggests that there is only one stock in the North Atlantic, the IWC SC decided to retain the three main medium areas (E, Central, W) as a precautionary measure.

The sixth and last year of the 6-year programme 2008-2013 to cover the northeast Atlantic to provide a new abundance estimate of common minke whales every sixth year as part of the management scheme established for this species, was conducted during the periods 25 June to 15 July and 15 July to 18 August 2013. Sighting surveys were conducted with the institute vessel R/V *Håkon Mosby* and the chartered vessel M/S *Båragutt*, respectively, in the eastern Barents Sea Norwegian coast. The covered area was the IWC *Small Area EB* (eastern Barents Sea) which is part of the Medium Management Area E, comprising waters in the northeast Atlantic. During primary search effort, the number of observations from the primary platform was 144 sightings of common minke whales.

Zabavnikov informed the SC that increases in common minke whale numbers and a wider distribution, compared to previous surveys, had been observed during the last Russian-Norwegian Ecosystem Survey and other observations in the Barents Sea. These observations took place between August and the beginning of October. For example, several individuals were observed in the far north-eastern part of the Barents Sea on the border with the Kara Sea.

8.5. Beluga

8.5.2. Review of active requests

R-3.4.9 (effects of human disturbance, including noise and shipping activities, on the distribution, behaviour and conservation status of belugas, particularly in West Greenland): **Ongoing**

R-3.4.10 (future surveys should be planned using hunter knowledge): The SC views this request as now **completed/archived**.

R-3.4.11 (update assessment of narwhal and beluga): This is a **standing** request.

8.5.3. Update

A programme continued in Norway with satellite tracking and collection of blood and blubber sampling for various investigations of pollution, diet and health status of Svalbard belugas. Eight animals were captured for this purpose in the summer of 2014. At least one more field season will be needed before analysis will begin on data that has been collected.

8.5.4. Future work

The above-mentioned work will continue for at least one more season.

8.5.4.1. *JCNB/NAMMCO JWG meeting*

A Scientific Working Group meeting is scheduled for 9-12 March 2015, in Ottawa Canada.

8.5.4.2. *Global review of monodontids*

The planning for a Global Review of Monodontids symposium has begun. Preliminary plans are to hold the meeting in conjunction with the Marine Mammals of the Holarctic meeting in the fall of 2016 in Russia (city to be determined).

Lockyer attended the Holarctic meeting this year in St Petersburg, Russia and discussed this venture with the organisers. The members of the Council of Marine Mammals organising the Marine Mammals of the Holarctic conference were presented with the NAMMCO proposal for a fall 2016 symposium – workshop by Christina Lockyer at their Council meeting. The following items were included:

- The proposal is for a 3-day scientific symposium - workshop, with invited experts on monodontids, and about 50 international participants
- The focus of the scientific symposium - workshop would be a comprehensive review of all aspects of the biology and study of belugas and narwhals in all regions where they occur
- The scientific symposium-workshop should be held in conjunction with the 2016 Conference on Holarctic Marine Mammals – before or after the event
- The rationale being that this conference is attended by many Russian experts researching belugas, and would attract a high attendance of relevant experts
- External funding would be sought to support attendees internationally as well as from within Russia, and an organising committee has already been established
- A scientific report would be produced after the event, to be published online together with presented scientific papers in the free access NAMMCO Scientific Publications Series site at http://septentrio.uit.no/index.php/NAMMCOSP/index

The Council of Marine Mammals was agreeable to the proposal and will cooperate with NAMMCO on this event.

The Steering Committee will be chaired by Arne Bjørge, and the other members of the Committee are Jill Prewitt (NAMMCO), Olga Shpak (Russia), Randy Reeves (Canada), Steve Ferguson (Canada), Rikke Guldborg Hansen (Greenland), Rod Hobbs (USA), Christina Lockyer (NAMMCO) and Rod Hobbs (USA).

8.5.4.3. *Disturbance Symposium*

Planning for a Disturbance Symposium that will deal with the impacts of human disturbance on narwhal, beluga and walrus is underway. Preliminary plans are to hold the meeting in early October 2015 in Copenhagen. Kit Kovacs has agreed to Chair the meeting.

The primary objectives of the Symposium will be to 1) present an overview of the information currently available, and 2) make recommendations for both restrictions of anthropogenic disturbances and future studies. The conclusions will be available to stakeholders shortly after the meeting in the form of a report with specific recommendations. Participants may also be invited to submit papers stemming from the symposium for publication in a special volume of the *NAMMCO Scientific Publications* series.

A first announcement of the meeting will be sent to prospective participants soon.

The SC **recommended** broadening the scope of the Symposium and include presentations from other species/research. A number of external experts will be required for this meeting.

8.6. Narwhal

8.6.1. Review of active requests

R-3.4.10 (future surveys should be planned using hunter knowledge): The SC views this request as now **completed**.

R-3.4.11 (update assessment of narwhal and beluga): This is a **standing** request.

R-3.4.12 (advice on sustainable takes of narwhal in Kane Basin). The SC noted that R-3.4.11 covers this request, and view this request as **replaced with 3.4.11**.

8.6.2. Updates

The Catch Allocation Sub-Group of the NAMMCO-Joint Commission on Narwhal & Beluga met in Copenhagen on 10–12 March 2014 with the main purpose of developing an allocation model that will provide a mechanism for assigning harvested animals (narwhals) to summer stocks (SC/21/07). After review of available information on movements and phenology of narwhals in Canada and Greenland a matrix model with columns for harvest locations and rows for stocks was developed. Allocation of catches to stocks was based on different criteria of levels of availability ranging from no availability for stocks that with certainty did not contribute to the hunt, to stocks that definitely supplied the hunt at identified hunting localities. Intermediate availabilities were established based on the proportion of satellite-tracked whales that visited the localities. Initial work on the sensitivity of the availabilities included estimating the variance around the detection of

tracked whales visiting hunting grounds. The model could potentially be used for both estimating the fraction of the hunt that is supplied from each summering stock as well as the sustainable takes at each hunting locality.

The SC **noted** that potential problems may arise if hunters take their whole quota from a single small stock. One way to reduce the risk of this is to look at within season movements with satellite tags to see how the stocks' movements overlap (e.g., early spring vs late spring, may be able to determine which stock moves early vs late).

Heide-Jørgensen presented preliminary results from research related to seismic activities and their effects on narwhal. Previous studies (Heide-Jørgensen *et al*. 2013) showed recent ice entrapments that may be related to seismic activity. New research in Greenland included studies of acoustics, kinematics, feeding behaviour and heart rate. One goal is to develop an instrument package that can be used to look at the effects of disturbance on different marine mammals. Tagging work is conducted in Scoresby Sound, East Greenland, with the aid of hunters helping to catch narwhal. The tags stay on from hours to a few days and then pop off. Currently they are working on obtaining baseline profiles, but in the future the aim is to look at the effects of an individual disturbance event (e.g., if normal bradycardic pattern is interrupted it could interfere with normal gas exchange).

Greenland is also deploying acoustic tags which record the background noise level in the animal's environment as well as animal vocalisations. These data have shown that "buzzes" from narwhals are linked to wiggles in the dive profiles. Stomach temperature pills are also being used, which record drops in temperature correlated with feeding activity. These tags remain in the stomach for about 8 days and communicate data to the satellite tag on the back. The stomach temperature data can also be correlated to the buzzes and the dive wiggles, and can give an estimate of feeding rate. In the future they also plan to look at larger scale changes in behaviour with disturbances.

8.6.3. Future work

Studies of the effects of disturbance on narwhal (described above) are ongoing.

8.6.3.1. *Planning JCNB/NAMMCO JWG meeting (taken above in 8.5.3.1)*

The next JWG meeting will be held in March 2015 in Ottawa, Canada.

8.6.3.2. *Global review of Monodontids (taken above in 8.5.3.2)*

The Global Review of Monodontids was discussed under Item 8.5.3.2

8.6.3.3. *Disturbance Symposium (taken above in 8.5.3.3)*

The Disturbance Symposium was discussed above in 8.5.3.3

8.7. Bottlenose whale

8.7.2. Update

There is an ongoing project being conducted in Norway related to sonar noise disturbance on bottlenose whales.

The Russian NPR reported that singles and pairs of northern bottlenose whales were observed. From acoustic trawl data, these animals appeared closely associated with squid aggregations in the western part of the northern trackline in their research area (Irminger Sea).

8.7.3. Future work

No future work on bottlenose whales was reported.

8.7.4. Abundance estimate

NAMMCO does not have an endorsed abundance estimate for the most recent sightings surveys. The latest available abundance estimate is 24,561 (CV 0.23), for the Icelandic and Faroese blocks of the ship-based part of the NASS-2001 survey. This abundance estimate was presented to the SC in 2003, but has not been formally endorsed.

8.8. Killer whale

8.8.2. Review of active requests (R-3.7.2)

R-3.7.2 (abundance, stock structure, migration and feeding ecology of killer whales in West Greenland): This request is **ongoing**. There is still not enough information to answer the request. Unfortunately catch information in Greenland was not available for review by the SC at this meeting.

8.8.3. Update

Rosing-Asvid updated the SC that killer whales in SE Greenland were found to have tooth wear that looks like they are fish eating killer whales but seals were found in the stomachs (9 killer whales; Foote *et al.* 2013).

A 3-year research project on feeding behaviour, movements and acoustics of killer whales in Icelandic waters conducted by the MRI will be finalized in 2015. Photo-identification has revealed several instances of movement of killer whales between the Shetland Islands and Iceland.

Lydersen reported on a newly published paper on killer whales in Norway (Vongraven and Bisther 2014). This study presents the results of 10 years of observational and photo-identification data of a population of killer whales that follows the Norwegian spring-spawning stock of Atlantic herring. Although the whales were predominantly observed while feeding upon herring, one pod of herring-eating whales was also observed interacting with seals. This supports the hypothesis based on the long-term markers, of a degree of specialization, with a small number of groups persistently feeding upon mammals, but switching between herring and seals. They further investigated this prey switching by conducting playbacks of herring-eating killer whale sounds to harbour seals at haulout sites on the herring spawning grounds. They recorded changes in behaviour consistent with an anti-predator response, suggesting the seals perceived the herring-eating killer whales as a potential predatory threat and had not habituated to their calls.

Haug informed the SC of a study of possible interactions between sperm whales and killer whales took place in the Bleik canyon in the Vesterålen archipelago, North Norway. This area is a habitat for large solitary male sperm whales and killer whale pods. Using local whale-watching boats as opportunistic platforms and photo-identification as indirect method, the study examined the quantity and the nature of interactions between sperm whales and killer whales from 2008 to 2012. The results suggest that killer whale aggressions toward sperm whales are common in the area. The study shows that there are significant annual, but not seasonal, variation in killer whale attacks on sperm whales. Killer whales do not display a selective biting of the sperm whale fluke, suggesting that all the parts of the fluke are equally likely to be attacked.

Zabavnikov informed the SC that the Russian-Norwegian Ecosystem survey in 2013 observed several killer whales between Barents and Kara Seas and saw several harp seals in the same area. The killer whales are possibly feeding on these seals. This is the first time seeing killer whales this far north and east.

8.8.4. Future work

Rosing-Asvid informed the SC that there is ongoing research in Greenland on killer whales.

8.9. Pilot whale

8.9.2. Review of active

R-3.8.3 through **R-3.8.6**: These requests are all related to conducting an assessment of pilot whales. They are all ongoing, and the next assessment will not occur until after the next sightings survey.

8.9.3. Update

Mikkelsen updated on progress for a future assessment of pilot whales. No pilot whales were satellite tagged in 2013 and 2014. Efforts have increased in the sampling programme of harvested animals, prioritizing obtaining teeth for ageing, skin samples, and reproductive parameters for each animal. A total of 270 animals were sampled in 2013.

Desportes commented on the extent of pilot whale movement revealed by the 2012 satellite tracking and presented to the SC last year. As ICES (1996) concluded, the effect of catches of pilot whales in the Faroe Islands depended critically on the geographic range of the population where the catches are coming from, referring to four areas (Fig. 1): 1) the area covered by the NASS 1989 sighting survey, 2) Mid-Atlantic Ridge-Iceland Area, 3) Rockall-Iceland Area and 4) Faroe Islands Area.

A= Faroe Islands Area

A+B= Rockall-Iceland Area

A+B+C= Mid-Atlantic Ridge-Faroes Area

A+B+C+D= NASS-1989

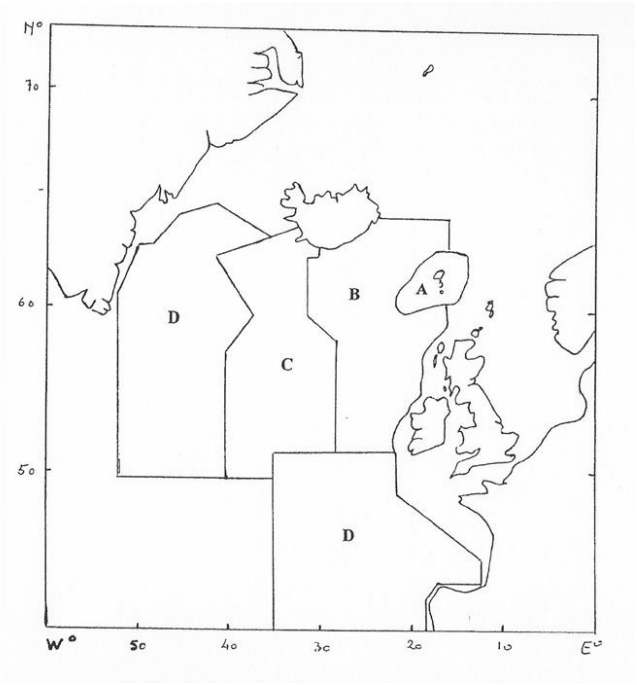

Figure 1. The four areas referred to in the 1996 assessment (ICES 1996)

Based on the result of the 1989 surveys, the catch over the last 150 years would have hardly any impact on the population trajectory if coming from the two larger areas. In this context, the 2012 satellite tracks are interesting as they show two pilot whales caught in the Faroe Islands moving well beyond the Mid-Atlantic Ridge Area (Fig. 2).

Figure 2. Satellite tracks of two pilot whales from the same pod tagged in the Faroes in 2012.

8.9.4. Future work

Satellite tagging will be conducted in 2015 prior to TNASS2015 survey activities.

8.10. Dolphins

8.10.2. Review of active requests

R-3.9.6 (assessments of dolphin species): The SC noted that this request is **ongoing**, and that there is no new information for bottlenose dolphins from the Faroes and the analysis of the data from white sided dolphins has not been completed.

8.10.3. Update

There were no updates of research on dolphin species.

8.10.4. Future work

Analysis from white sided dolphin data from the Faroes is awaiting completion.

8.11. Harbour porpoise

8.11.2. Review of active requests

R-3.10.1 (comprehensive assessment): This request is **ongoing**. A future harbour porpoise WG will be scheduled after a report from the By-catch WG, new data from T-NASS2015, and progress on research requests from the 2013 HPWG.

8.11.3. Update

Genetics studies are ongoing in Greenland and Iceland.

By-catch estimates from Iceland were received, and harbour porpoises were found to be one of the species of marine mammals most commonly caught in the net fisheries in Icelandic waters (see Item 6.1.1). The SC **recommended** that this information be passed on to the By-catch WG and the Harbour Porpoise WG.

Heide-Jørgensen updated the SC on tagging efforts of harbour porpoises in West Greenland. Fifteen animals were tagged in 2014, and in contrast to results previously presented to the HPWG in 2013, this year most of the tagged porpoises stayed on the continental shelf through September. Greenland also sampled about 150 porpoises from the hunt to complement previous sampling efforts in 1995 and 2009. The porpoises seem to react positively to climate change in terms of increased body mass (between 1995 and 2009; data from 2014 to come). The previous samples were collected in September, but this years' samples were collected from June-October to look at possible seasonal changes. In the period 1995–2009, stomach contents showed increased diversity of prey, with lots of cod in 2009.

Desportes informed the SC of an ongoing study investigating reproductive failure in over 320 female porpoises stranded in the UK in relation to PCB exposure. Nearly 20% of sexually mature females showed direct evidence of reproductive failure from a variety of causes. A low pregnancy rate of 50% was estimated for females that died of non-disease related (i.e. traumatic) causes of death, which significantly lower than other populations. The study should be published soon. These preliminary results are noteworthy.

Desportes noted that the SAMBAH (Static Acoustic Monitoring of the Baltic Sea Harbour Porpoise) project, which includes the Baltic countries, and Sea Mammal Research Unit have deployed t-pods (passive acoustic devices) around the Baltic Sea. A method has been developed to use these recordings to obtain an abundance estimate. The SC noted that this may not be a useful method for areas of high abundance as is expected in Norway.

Lockyer noted recent papers (Bouveroux *et al.* 2014, Haelters *et al.* 2012) on grey seals attacking and eating harbour porpoises.

8.11.3.1. *Review recommendations from 2013 HPWG*

Regarding recommendations given at the HPWG in 2013, Norway are continuing to collect data from the reference fleet and bycatch estimations will be updated. The reference fleet has not yet been expanded to the lumpfish fishery. An application has been made for a feasibility study in Vestfjord for a shipboard survey for harbour porpoises in the fjord systems. Experiments with pingers on monkfish gillnets are in progress in the Vestfjord area.

8.11.4. Future work

Norway reported on a possible shipboard survey in Vestfjord area.

8.12. Sperm whale

8.12.1 Update

See above under 8.8.2 concerning interactions of killer and sperm whales in the Vesterålen archipelago, North Norway.

8.13. Bowhead whale

8.13.1 Update

Heide-Jørgensen presented Rekdal *et al.* (2014) which gives a new abundance estimate using genetics. The paper showed larger abundance estimates using genetics versus aerial surveys, probably because the population in West Greenland is a segregation of animals that mostly summer in the Canadian High Arctic. Aerial surveys provide a snapshot of the population; whereas genetics take into account all animals contributing to this population of animals. These genetics results confirm the assumption that the population is larger than previous abundance estimates. These assumptions were based on data showing that animals passing through West Greenland (not every year), are 83% females, and older than 40 years, therefore the population must consist of more animals.

In Norway, the programme using passive acoustic monitoring devices for bowhead whales using AURALs (**A**utonomous **U**nderwater **R**ecorded for **A**coustic **L**istening) is ongoing. Four such units were deployed in 2013 and three retrieved and redeployed in 2014 (too much ice on the 4th mooring). These AURALs will be analysed for presence of bowhead whales, in addition to presence of other marine mammals (narwhals, belugas, bearded seals, fin whales and blue whales) and anthropogenic noise from seismic and other activities.

8.13.2. Future work

8.13.3 OSPAR request

The Secretariat will respond to an inquiry from OSPAR regarding population status of marine mammals in the North Atlantic. NAMMCO regards bowheads as endangered in OSPAR Region 1 which covers the Northeast Atlantic.

8.14 Blue Whale

In Iceland, one blue whale was satellite tagged in 2013 and two in 2014. The whale tagged in mid July 2013 north of Iceland travelled southwards to 59° N. The whales tagged in 2014 travelled north of Iceland towards 73° N. Iceland has been collecting biopsies and the samples (10-20) are currently being stored in the MRI archive.

Notable increases in numbers of blue whales were seen in Svalbard over last 2–3 years. This year there were also many sighting during the Norwegian Sightings survey and the Arctic part of the Ecosystem survey, perhaps those whales moving north from Iceland to Svalbard area. Animals identified earlier via photo-id off West Iceland in mid-summer were identified north of Iceland in mid-summer now.

Zabavnikov informed the SC that during the last several Russian-Norwegian Ecosystem Surveys (ES) in the Barents Sea blue whales were regularly seen each year. In the last Ecosystem Survey, 24 blue whale individuals were observed close to Svalbard and between Svalbard and Franz Joseph Land.

9. SURVEY PLANNING

9.1. T-NASS2015 and Survey Planning WG

Heide-Jørgensen presented the T-NASS2015 Proposal (SC/21/13), which was presented at the Council meeting in February 2014.

Gunnlaugsson presented the Survey Planning Working Group report (ANNEX 1).

Overview of plans and resources by jurisdiction

The Iceland proposed governmental budget includes 8.2 mill NOK, corresponding to ¾ of the required amount in the MRI T-NASS2015 proposal (including National Surveys and Extension survey), leaving ¼ unfunded. The Faroe Islands Fishery Ministry has put 1.81 mill NOK in the proposed governmental budget for a ship based survey and also included an additional 1.13 mill NOK for the extension survey. Greenland has applied for the funding for their National surveys through the Greenland Institute of Natural Resources and an additional 1.02 mill NOK has been included in the Greenland Government budget as a contribution to the Extension survey. Norwegian national surveys through the IMR would cover the EW *Small Area* (IWC terminology) which includes the Norwegian Sea from the coastline to 3°E in the northern part and around

Faroe Islands in the south. The SC was unable to get confirmation on whether the Jan Mayen Extension area was included in the proposed Norwegian governmental budget (outside of the IMR budget) as Norway's contribution to the extension survey.

All of the proposed governmental budgets are yet to be approved.

One of three primary objectives for T-NASS2015 is to obtain a complete synoptic abundance estimate for common minke whales in the central area of the North Atlantic. The **SC agreed** that it will not be able to fully achieve this objective if funding for the extension areas is not confirmed by early January 2015.

The SC **recommended** that the "T" be removed from T-NASS, given that there will not be coverage in the West Atlantic. The NAMMCO project remains the same, but will be called NASS2015 going forward.

Survey design and methods

Norway

Norwegian surveys will use the same methodology for both the *EW* small area and the Jan Mayen (*CM*) extension area as in previous surveys. Norway stressed that a condition to their contribution to the Jan Mayen Extension survey area is that the Norwegian IO method is fully implemented in the entire area.

The Norwegian survey methods use two symmetrical platforms with two sets of observers using cues as sighting units. The survey is conducted in passing mode. Sighting is done without binoculars, and it is important to have both platforms doing exactly the same thing.

The SC discussed that Svalbard was not included in the proposed TNASS2015 area because it is included in the Norwegian mosaic survey. This area was last surveyed in 2014.

Iceland

In Iceland the plan is to use two or three survey vessels: one would also be doing a mackerel survey and cover the Icelandic economic zone including roughly 1/3 of the Jan Mayen extension survey area. Mackerel surveys stop for trawling and oceanographic sampling for about an hour twice to three times during the day, therefore it seems acceptable to use this platform for cetacean surveys.

The Icelandic survey will use two symmetrical platforms, and will use binoculars to some degree. For common minke whales, cue count data will be collected and it will be investigated whether the Norwegian analysis method can be used, or else conventional cue count or line transect analyses will be used. The mackerel vessel would not be able to close, so they will survey in passing mode. The other vessels will survey in delayed closing mode, but will not close on common minke whales. Fin whales frequently overlap with sei and blue whales and can easily be confused, therefore species ID is particularly important for the Icelandic surveys justifying the use of binoculars and delayed closing mode.

Faroe Islands

The Faroe Islands will be using both a dedicated survey vessel, and if feasible, a mackerel survey vessel. The dedicated survey vessel will operate with double platform IO mode and in delayed closing mode using standard line transect. The Faroese plan to measure noise on vessels to determine whether they can use acoustics.

A primary question is how to obtain reliable group size estimates for pilot whale groups. It was agreed that drones and helikites should be tested as a method of obtaining independent group size estimates of pilot whales.

The group discussed the status of satellite tracking in pilot whales. The tagging is fairly important for deciding on where to allocate survey effort, but if tagging data is lacking, plans could fall back on previous survey results for allocating survey effort.

Russia

Russian redfish surveys in the Irminger Sea in June/July 2015 will include dedicated cetacean observers.

Aerial Surveys in Greenland and Iceland

Greenland will fly the Twin Otter and plans to use the same protocols as previous surveys, including a full

double platform setup, and allowing for cue counting, strip census, and line transect estimation if needed. Availability of whales at the surface will be estimated from dive data recorders.

Iceland will fly the Partenavia in coastal areas and will use the same protocols as previous surveys, with a partial double platform setup, data collected in cue counting mode for common minke whales, and standard line transect for other species. Iceland plans to add either a still or video camera to assist the IO platform and distance and group size estimation.

Observers, Data collection and Equipment needs
It was considered mandatory for the success of the survey that initial testing of drones and recording systems should be started as soon as possible. The SC recommended that available funds from the SC should be spent on acquiring these pieces of equipment.

Other pieces of equipment needed for the surveys can be acquired during spring 2015 under the national budgets, or money budgeted in the SC for survey coordination.

Observer candidates should be contacted soon to ensure availability for the survey. It is also important that cruise leaders and observers are trained before the survey.

Future Plans
The T-NASS Steering Committee will keep in contact for the next 6 months and meet if necessary to ensure adequate planning and execution of the surveys.

The SC was pleased to see progress in the Action Plan as outlined by the Survey Planning Working Group.

9.2 <u>Publications from T-NASS-07</u> [SC/21/12]
The SC noted that there are papers from the T-NASS-07 that the SC would like to see published. The Secretariat will contact the NAMMCO authors for updates on their publication plans for these papers. If there are enough papers to warrant a *NAMMCO Scientific Publications* volume, the Secretariat will contact the Canadians and Americans to see if they would like to publish in this potential volume.

10. NAMMCO SCIENTIFIC PUBLICATIONS

10.1. Walrus
Prewitt informed the SC that all papers in Volume 9: *Walrus of the North Atlantic* have now been published online. The hard copy is now in the process of being typeset by the publishers (Bokstavhuset in Tromsø). The hope is that the printing will take place before the end of 2014, but by the end of January 2015 at the latest.

10.2. Monodontid age estimation
There are now four papers that have been published online, and a few more are nearing completion.

10.3 Other matters- printing of hard copies
At the 22nd NAMMCO Council Meeting it was decided that Volume 9 will be the last volume printed as a hard copy. Starting with Volume 10, all future volumes will be published online only. However, professional typesetting will still be done when all papers are completed.

10.4 Next volume
The SC discussed whether to keep the *NAMMCO Scientific Publications* as themed volumes, or open the journal up to rolling submissions. The SC **recommends** that this issue is discussed with Editorial Board, especially since this could increase the workload of the Board members, whereas the themed volumes have scientific editors that take on the majority of the editorial work. The Secretariat will report back to the SC at the next meeting.

11. DATABASES ON ABUNDANCE AND CATCHES

11.1. Abundance

The Secretariat has begun working on a table of accepted abundances estimates. This will be presented to the SC at the next meeting.

The SC **recommends** that when future assessments are completed, all data used in the assessment should be archived in an appendix to the report and with the Secretariat.

11.2. Catches

Catches have been reported in the National progress reports using the new table format recommended last year.

12. WORK PROCEDURES IN THE SC

12.1. Classification of requests [SC/21/09]

Each request was discussed under the specific agenda item.

12.2. Requests for data from outside countries/organizations

The Secretariat and member countries regularly receive requests for data, particularly from sightings surveys. Collating and providing these data can be time consuming, and often is not particularly beneficial to the countries providing the data. The SC **agreed** that requests for data that come through the NAMMCO Secretariat should be directed to the individual country.

13. FUTURE WORK PLANS

13.1. Scientific Committee

The next meeting will be held in the Faroe Islands in the fall of 2015. The dates will be decided via correspondence.

13.2. Working groups

1) Walrus Working Group

The WWG should convene a one-day meeting in March 2015 to update advice on sustainable takes of walruses in the Baffin Bay stock. If feasible the meeting could be conducted as a teleconference and participants would include Wiig (Chair), Witting, Heide-Jørgensen, Hansen, Lydersen, Acquarone, Ugarte and Stewart.

2) JCNB/NAMMCO Joint Scientific Working Group

The next JWG meeting will be held in March 2015 in Ottawa, Canada. One of the tasks at the start of the meeting is for the Catch Allocation subgroup to complete the model.

The meeting will update the assessment of narwhal and belugas.

3) Large Whale Assessment

A Large Whale Assessment meeting was previously planned for the fall of 2014. This was postponed to the fall of 2015, awaiting work to be completed by the IWC on the fin and minke whale *Implementation Reviews*. The NAMMCO LWAWG will plan on meeting in the fall of 2015 in hopes that the work on the IWC SC will be complete.

4) Disturbance Symposium

Planning for a Disturbance Symposium that will deal with the impacts of human disturbance on narwhal, beluga and walrus is underway. Preliminary plans are to hold the meeting in early October 2015 in Copenhagen. Kit Kovacs has agreed to Chair the meeting and Mads Peter Heide-Jørgensen is the NAMMCO Convenor.

The primary objectives of the Symposium will be to 1) present an overview of the information currently available; and 2) make recommendations for both restrictions of anthropogenic disturbances and future studies. The conclusions will be available to stakeholders shortly after the meeting in the form of a report with specific recommendations. Participants may also be invited to submit papers stemming from the symposium for publication in a special volume of the

NAMMCO Scientific Publications series. Several external experts will need to be invited. A first announcement of the meeting will be sent to prospective participants soon.

The following meetings are planned for early 2016:

5) By-catch WG

With new information available on by-catch, the SC recommended convening a By-catch Working Group. This would be a technical WG that could focus on discussing the methods that are being used to collect the data and extrapolate the results, and decide if further work is required.

Suggested Terms of Reference:

By including external expertise from fisheries and marine mammal science, the WG would

1. Identify all fisheries with potential by-catch of marine mammals
2. Review and evaluate current by-catch estimates for marine mammals in NAMMCO countries.
3. If necessary, provide advice on improved data collection and estimation methods to obtain best estimates of total by-catch over time.

The SC suggested that the By-catch WG could meet just prior to the Coastal Seals WG and recommended that Desportes be appointed convenor.

6) Coastal Seals

A Coastal Seals WG (Chair: Kjell Tormod Nilssen) meeting has been tentatively scheduled for February 2016 to address R-2.4.2 and R-2.5.2.

The Terms of Reference for the meeting will be for the WG to:

1) assess the status of all populations, particularly using new abundance estimate data that are available from Iceland and Norway.

2) address by-catch issues (grey seals) in Norway, Iceland, and the Faroe Islands

3) re-evaluate the Norwegian management plans (which have been already implemented) for grey and harbour seals.

14. BUDGET

14.1. Spending in 2014 [SC/21/08]

Prewitt presented the budget data to the SC members (SC/21/08). Approx. 64,000 NOK of the T-NASS2015 budget was allocated for purchasing and testing equipment. The items prioritized were the drone (for the Faroes survey), inclinometer and Redhen system. The Secretariat requested that bids for purchase be sent in as soon as possible so that the Scientific Secretary can check costs against the budget available. It was noted that if the items were ordered immediately they might be available by the end of the year.

14.2. Budget for 2014/15

A budget for 2015 was prepared and the total is 466,000 NOK, including 200,000 for T-NASS2015.
A preliminary budget was prepared for 2016.

15. ANY OTHER BUSINESS

15.1. Number of SC members at meeting from each country

The SC **recommends** again that ROP should be amended to allow more than three members from each country at the meeting. Each country would still only have one vote.

Proposal by the NAMMCO SC for rewording of the ROP, item II on Membership:

Current wording:

II. Membership

1. Each Member Country shall nominate up to six scientists as members of the Scientific Committee with no more than three members present at any Scientific Committee meeting. The appointment is permanent or until the Member Country nominates new member(s) to the Committee. Each Member Country shall have one vote when procedural or organizational matters are being dealt with.

Revised wording (changes are in **bold**):

II. Membership

1. Each Member Country shall nominate up to six scientists as members of the Scientific Committee, **every one of whom may be** present at any Scientific Committee meeting. The appointment is permanent or until the Member Country nominates new member(s) to the Committee. Each Member Country shall have one vote when procedural or organizational matters are being dealt with.

15.2 Stock Status List Update

Desportes presented the Stock Status List website that will be incorporated into the new NAMMCO website. SC members are asked to provide comments on the website to Desportes or the Scientific Secretary before 15 November 2014 in order to have the site ready by the end of the year.

The website has been designed so that it will be easy to update with new information, and will be updated regularly by the Secretariat. However, SC members are encouraged to send new information and photographs at any time.

The SC was very pleased with the website and **commended** Geneviève Desportes and Daniel Pike for their work.

15.3 NPR format

The format of the NPR was not discussed.

16. MEETING CLOSURE

16.1. Acceptance of report

The report was accepted via correspondence on 26 November 2014.

16.2. Closing remarks.

The SC thanked the Chair and the rapporteur for their efforts. They also thanked Nils Øien and Tore Haug for their help with the lunches and other logistics.

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Appendix 1: Agenda

Paper numbers in [ ]. Grey shading means not available yet.

1. CHAIRMAN'S WELCOME AND OPENING REMARKS
2. ADOPTION OF AGENDA
3. APPOINTMENT OF RAPPORTEUR
4. REVIEW OF AVAILABLE DOCUMENTS AND REPORTS
- **4.1.** National Progress Reports [SC/21/NPR-F, -G, -I, -N, -C, -J, -R]
- **4.2.** Working Group Reports [SC/21/07, SC/21/13]
- **4.3.** Other reports and documents

5. COOPERATION WITH OTHER ORGANISATIONS
- **5.1.** IWC [SC/21/05]
- **5.2.** ASCOBANS [SC/21/06]
- **5.3.** ICES [SC/21/04]
  - **5.3.1.** Request to ICES for NAMMCO to join WG
- **5.4.** JCNB [SC/21/07]
- **5.5.** Other

6. ENVIRONMENTAL / ECOSYSTEM ISSUES
- **6.1.** Marine mammals-fisheries interactions (R- 1.1.2, 1.1.3, 1.1.6, 1.1.7, 1.1.8) [SC/21/O/09]
  - **6.1.1.** By-catch [SC/21/11]
- **6.2.** Multispecies approaches to management (R- 1.2.1, 1.2.2)
- **6.3.** Economic aspects of marine mammal-fisheries interactions (R- 1.4.1, 1.4.2, 1.4.3, 1.4.5, 1.4.6)
- **6.4.** Environmental issues (R-1.5.1); [SC/21/O04]
- **6.5.** Monitoring marine mammal stock levels and trends in stocks / North Atlantic Sightings Surveys (NASS) (R-1.7.11, 1.7.12)
- **6.6.** OTHER (R-1.8.1, 1.8.2)

7. SEALS AND WALRUS STOCKS - STATUS AND ADVICE TO THE COUNCIL
- **7.1.** Harp Seal
  - **7.1.1.** Review of active requests (R-2.1.4, 2.1.6)
  - **7.1.2.** Update
  - **7.1.3.** Future work
- **7.2.** Hooded seal
  - **7.2.1.** Review of active requests (R-2.1.4 {also in 7.1.1}, 2.1.9, 2.1.10, 2.1.11)
  - **7.2.2.** Update
  - **7.2.3.** Future work
- **7.3.** Ringed seal
  - **7.3.1.** Review of active requests (R-2.3.1, 2.3.2)
  - **7.3.2.** Update
  - **7.3.3.** Future work
    - 7.3.3.1. Possible WG
- **7.4.** Grey seal
  - **7.4.1.** Review of active requests (R-2.4.2)
  - **7.4.2.** Update
  - **7.4.3.** Future work
    - 7.4.3.1. Coastal Seals WG
- **7.5.** Harbour seal
  - **7.5.1.** Review of active requests (R-2.5.2)
  - **7.5.2.** Update
    - 7.5.2.1. Presentation from Japan
  - **7.5.3.** Future work
    - 7.5.3.1. Coastal Seals WG
- **7.6.** Bearded seal
  - **7.6.1.** Update
  - **7.6.2.** Future work
- **7.7.** Walrus

7.7.1. Review of active requests (R-2.6.3)
7.7.2. Update
7.7.2.1. Review of recommendations from 2013 Walrus WG [SC/21/10]
7.7.3. Future work
7.7.3.1. Disturbance workshop (R-2.6.3)

8. CETACEANS STOCKS - STATUS AND ADVICE TO THE COUNCIL
8.1. Fin whale
8.1.1. Review of active requests (R-3.1.7)
8.1.2. Update
8.1.3. Future work
8.1.3.1. Large Whale Assessment WG Fall 2015
8.2. Humpback whale
8.2.1. Review of active requests (R-3.2.4)
8.2.2. Update
8.2.3. Future work
8.3. Sei whale
8.3.1. Review of active requests (R-3.5.3 amended)
8.3.2. Update
8.3.3. Future work
8.4. Minke whale
8.4.1. Review of active requests (R-3.3.4)
8.4.2. Update
8.4.3. Future work
8.5. Beluga
8.5.1. Review of active requests (R-3.4.9, 3.4.10, 3.4.11)
8.5.2. Update
8.5.3. Future work
8.5.3.1. JCNB/NAMMCO JWG meeting- March 2015, Ottawa Canada
8.5.3.2. Global review of Monodontids
8.5.3.3. Disturbance workshop
8.5.3.4. Other
8.6. Narwhal
8.6.1. Review of active requests (R-3.4.9, 3.4.10, 3.4.11, 3.4.12)
8.6.2. Updates
8.6.3. Future work
8.6.3.1. Planning JCNB/NAMMCO JWG meeting (taken above in 8.5.3.1)
8.6.3.2. Global review of Monodontids (taken above in 8.5.3.2)
8.6.3.3. Disturbance workshop (taken above in 8.5.3.3)
8.6.3.4. Other
8.7. Bottlenose whale
8.7.1. Update
8.7.2. Future work
8.7.3. Abundance estimate?
8.8. Killer whale
8.8.1. Review of active requests (R-3.7.2)
8.8.2. Update
8.8.3. Future work
8.9. Pilot whale
8.9.1. Review of active requests (R-3.8.3, 3.8.4, 3.8.5, 3.8.6)
8.9.2. Update
8.9.3. Future work
8.10. Dolphins
8.10.1. Review of active requests (R-3.9.6)
8.10.2. Update
8.10.3. Future work
8.11. Harbour porpoise
8.11.1. Review of active requests (R-3.10.1)
8.11.2. Update
8.11.2.1. Review recommendations from 2013 HPWG

8.11.2.2. Updates on catch/by-catch reporting and numbers
8.11.3. Future work
8.12. Sperm whale
8.12.1. Update
8.12.2. Future work
8.13. Bowhead whale
8.13.1. Update
8.13.2. Future work
8.13.3. OSPAR request

9. SURVEY PLANNING (taken above under item 6.5)
9.1. T-NASS2015 and Survey Planning WG
9.1.1. T-NASS2015 Status [SC/21/13, SC/21/14]
9.1.1.1. Funding
9.1.1.2. Planning
9.1.1.2.1. Plan A and Plan B
9.1.1.2.2. Future Meetings
9.1.2. Publications from T-NASS-07 [SC/21/12]
9.2. Other updates
9.3. Future work

10. NAMMCO SCIENTIFIC PUBLICATIONS
10.1. Walrus
10.2. Monodontid age estimation
10.3. Other matters- printing of hard copies
10.4. Next volume?

11. DATABASES ON ABUNDANCE AND CATCHES
11.1. Abundance
11.2. Catches

12. WORK PROCEDURES IN THE SC
12.1. Classification of requests [SC/21/09]
12.2. Requests for data from outside countries/organizations

13. FUTURE WORK PLANS
13.1. Scientific Committee
13.2. Working groups
13.3. Other matters

14. BUDGET
14.1. Spending in 2014 [SC/21/08]
14.2. Budget for 2014/15

15. ANY OTHER BUSINESS
15.1. Number of SC members at meeting from each country
15.2. NAMMCO Stock Status List Update
15.3. NPR format

16. MEETING CLOSURE
16.1. Acceptance of report
16.2. Closing remarks.

Appendix 2: List of documents

(*in italics documents expected but yet to be submitted*)

Doc.No.	Title	Agenda item
SC/21/01	Draft List of Participants	1
SC/21/02	Draft Agenda	2
SC/21/03	Draft List of Documents	4
SC/21/NPR-F	National Progress Report – Faroe Islands	4.1
SC/21/NPR-G	*National Progress Report – Greenland*	*4.1*
SC/21/NPR-I	National Progress Report – Iceland	4.1
SC/21/NPR-N	National Progress Report – Norway	4.1
SC/21/NPR-C	National Progress Report – Canada	4.1
SC/21/NPR-J-1	National Progress Report – Japan – Large cetaceans	4.1
SC/21/NPR-J-2	National Progress Report – Japan – Small cetaceans	4.1
SC/21/NPR-R	National Progress Report – Russian Federation	4.1
SC/21/04	Observer's report on activities in ICES	5.3
SC/21/05	*Observer's report: 65th meeting of the IWC Scientific Committee (Walløe)*	5.1
SC/21/06	Observer's report: ASCOBANS	5.2
SC/21/07	Summary of Report of the JCNB/NAMMCO Scientific Working Group on narwhal and beluga – Narwhal catch Allocation Model	4.2, 5.4
SC/21/08	NAMMCO Scientific Committee Expenses 2014 and Budget 2015	14
SC/21/09	Annex 2- Summary of All Requests from Council	6-8, 12.1
SC/21/10	Recommendations from 2013 WGs	7.7.2.1, 8.11.2.1
SC/21/11	Gunnlaugsson *et al.* Bycatch Iceland	6.1
SC/21/12	Status of TNASS-07 Papers for publication	6.5.2
SC/21/13	Report from TNASS/Survey Planning Working Group	6.5
SC/21/14	TNASS Steering Committee- Proposal for TNASS2015 (prepared at 3Feb14 Steering Committee meeting)	6.5

BACKGROUND DOCUMENTS

Doc.No.	Title	Agenda item
SC/21/O/01	CAFF Ringed seal report 2014	7.3
SC/21/O/02	Quintela *et al.* 2014 minke whale population structure	8.4
SC/21/O/03	Hammill *et al.* 2014 Abundance NWA harp seal	7.1.2
SC/21/O/04	Stenson and Hammill 2014 Harp seals poor ice	6.4
SC/21/O/05	Stenson *et al.* 2014 Density dependency reproduction in NWA harp seals	7.1.2
SC/21/O/06	Stenson *et al.* 2014 Pup production NWA harp seal 2012	7.1.2
SC/21/O/07	Rekdal *et al.* 2014 Trends bowhead W Greenland	8.13
SC/21/O/08	Klimova *et al.* 2014 Grey seal population structure	7.4
SC/21/O/09	Nøttestad *et al.* 2014 Killer whales Mackerel	6.1
SC/21/O/10	Blanchet *et al* 2014 Harbour seal movements	7.5.2
SC/21/O/11	Hamilton *et al.* 2014 Harbour seal haul-out	7.5.2
SC/21/O/12	Kovacs *et al* 2014 Walrus survey	7.7.2
SC/21/O/13	Lydersen *et al.* 2014 Glacier fronts	6.4
SC/21/O/14	Reeves *et al* 2014 endemic cetaceans	6.4 and 6.6
SC/21/O/15	Andersen et al. 2014 drift diving hooded seals	7.2
SC/21/O/16	Report of the IWC's Arctic Impacts Workshop	

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Appendix 4: Observer's reports

Agenda Item 5.1: IWC Observer's Report

Report of the work in the IWC Scientific Committee,
Bled, Slovenia
9-24th May 2014

The Norwegian delegation to the 65th IWC Scientific Committee (SC) meeting was led by Prof. Lars Walløe, who coordinated the report to the NAMMCO SC with help from Arne Bjørge, Tore Haug, Hans Skaug, Hiroko Solvang and Nils Øien. The report is structured so that it follows the SC agenda by topic. The report here reflects work of the sub-committees and also the SC plenary and provides items of both general interest and also of direct relevance for NAMMCO.

The meeting opened with a decision as to whether or not the JARPA II (Japan's Special Permit Programme in the Antarctic) should be discussed. The IWC Commission Chair requested the SC to evaluate the programme but Australia, United Kingdom and some other European and Latin American countries declined in the light of the International Court of Justice (ICJ) ruling in the Hague.

Catch Limit Algorithm (CLA) revision
In 2004 Norway proposed a change in the "tuning mechanism" of the CLA, and in addition that the MSYR should refer to the whole population (excluding young of the year). Reconsiderations in 2006, 2007 and 2013 permitted approval of this last change. However, before a decision could be made by the IWC SC on change in the tuning mechanism a few more trial simulations must be addressed, and these will be undertaken by the IWC Secretariat before the IWC SC meeting in 2015.

Revised Management Procedure (RMP) – implementation
Regarding the North Pacific minke whales and North Atlantic fin whales, there will be reviews in 2015.

For the North Atlantic common minke whales, there was a pre-meeting (Working Group - WG) in Copenhagen, chaired by Greg Donovan (IWC Secretariat) in April 2014 when population structure was discussed using new genetic data from 2004 and 2007 – 2011. The data now indicate only one population across the whole of the North Atlantic, but there is the possibility of adopting several population situations in the simulation implementation trials. Simulations are the core of the implementation procedure. Three populations are up for consideration, but for Norway and Iceland, if 3 "medium areas" are assumed, the number of management "small areas" will be reduced.

From surveys of common minke whales in the period 2008-2013, a population size of 94,000 has been estimated compared with 108,000 from an earlier period. This decrease is due to fewer whales in the Jan Mayen (Central stock) area while the population in the eastern area has not changed during the previous 6 yr. This new estimate can be used in the simulation trials. The Norwegian scientists explained that the existing method is robust, but the WG wanted to see a comparison between old and new methods. Data from the previous survey period 1996-2001 used before the 2005 meeting, should also be used along with that from the 2008-2013 survey period.

Walløe – the leader of the steering group – will work inter-sessionally on the Implementation Review and also hold a meeting. During the actual IWC SC meeting, it was proposed to change the simulation programme to be used in the simulation trials and use a light version of RMP03. The plan is to finalise the Implementation review in the next IWC SC meeting (2015).

By-catch
During an IWC workshop on Euthanasia, it was discussed and recommended that for large stranded whales, the most humane killing method was the use of the penthrite grenade using a darting gun. The IWC SC supported this recommendation.

AIS – Automated Identification System

AIS is used for larger vessels in all areas of high traffic. Along the US east coast, where humpback and right whales abound, regulation of ship traffic and speed reduction will minimise ship strikes. It has been observed that off Maui that with an increase in ship speed from 5 – 20 knots greatly increases the risk of ship strikes.

AWMP – Aboriginal Whaling Management Plan
Off Greenland, bowhead and humpback whales catches were of concern. In West Greenland, the strike limit of 2 bowheads was deemed sustainable for the population (as previously), and an annual strike of 10 humpback whales. For other species, a strike limit of 19 for fin whales was accepted and for common minke whales there was a strike limit of 164. In East Greenland, the strike limit for common minke whales was 12.

Environment
Focus was on the North Atlantic in the IWC SOCER report (an E mail-group). Here discussion was on contaminants, disease, mass strandings, the effects of noise and marine debris, and climate change.

On the east coast US, between July 2013 and April 2014, there had been outbreaks of DMV (dolphin morbillivirus); also in the Mediterranean. *Brucella* virus had also been reported in porpoises, common and striped dolphins off the US. There was a proposal for establishing a website where data and material on strandings, by-catch and catch – both at national and international levels – could be displayed and shared so that efforts to increase knowledge of the circumstances that favour epizootic outbreaks would help to monitor and understand the ecosystem.

Regarding noise, it was noted that military sonar problems in the Mediterranean and seismic disturbance continue to be a problem both at the level of causing physical damage to whales but also in causing behavioural changes.

Plans for an Arctic impact workshop remain unclear. Species in focus are beluga, narwhal and right whales, which may be affected by ice cover, ship traffic and human activities in the region. Reduced ice cover will expose whales to predators and also to competition with more southerly species that may ingress northwards as climate warms. The relatively slow-swimming right whales are especially vulnerable to high ship speed, particularly in calving areas.

Marine debris present an ongoing problem for whales which may consume plastic, leading ultimately to death. Presently, efforts are being made to chart marine debris, by type – consumable or of a type causing entrapment – and mitigation methods.

Ecosystem modelling
The IWC is seeking collaboration with CCAMLR in 2016 for a joint meeting. Here there was criticism for the JARPA II programme in connection with reported significant reductions in minke whale body condition (blubber thickness and fat content) during the JARPA period; also, for recent analyses of the decline in stomach fill. A full discussion of these matters was hindered by the non-participation of scientists from Australia and the United Kingdom (see earlier objections under the ICJ ruling).

Small Cetaceans
Here a variety of reports were received worldwide. Of concern was the reported live capture of belugas in the Okhotsk Sea where in 2013, there had been removals of 81 live individuals plus another 42 that perished during capture. The actual sustainable quota for the local population should not exceed 42 strikes annually.

Whale Watching
There is a growing development of ecotourism worldwide with an explosion of tour operators and boats which are often very fast, while restrictions and regulations regarding how close they may approach whales are often lacking. In addition, *swim with cetaceans* programmes are increasingly popular. There is a requirement for clear guidelines to regulate whale watching and contact, and also to monitor whale behaviour in relation to such activities.

DNA testing
In relation to the GenBank where there is a registry for catch and by-catch genetic data, Norway reported updating its registry for common minke whales.

Research Catches / Take
The conclusions from the JARPA II Antarctic research programme were that much investment had been placed on fieldwork, laboratory analyses and report writing but it was underlined that there should be an increased effort on data analyses. There were a series of recommendations from the review panel chaired by D. Palka (US).

After this review, Japan has stated that it will not proceed with JARPA II in the light of the ICJ ruling in the Hague, but will develop a new research programme that meets the requirements of the ICJ ruling. This new programme will be evaluated by an expert panel in the course of the first inter-sessional period and be discussed by the IWC SC next year (2015).

Agenda Item 5.2: ASCOBANS Observer's Report

Observer report from the 21th ASCOBANS Advisory Committee meeting
Gothenburg, Sweden, 29 September – 1 October 2014

NAMMCO was not represented at the meeting, but Desportes, who attended the meeting as Coordinator of the Conservation Plan for Harbour Porpoises in the North Sea, agreed to produce a summary of discussion items of specific interest and relevance to NAMMCO.

As usual, the ASCOBANS Advisory Committee (AC) meeting was organized in two sessions: a scientific session and an institutional session.

In the scientific session a number of reports were presented and discussed that emanated from various working groups appointed under ASCOBANS. Three of these focused on harbour porpoise conservation at a regional level in the remit of three regional Action Plans covering the Baltic, the Western Baltic, Belt Sea and Kattegat, and North Sea. Other working groups deal more generally with Threats to Small Cetaceans (By-catch, Underwater Noise, Negative Effects of Vessels and Other Forms of Disturbance, Pollution and its Effects, Marine Debris). Emerging issues are Climate Change, Renewable Energy and Migratory Species, Conservation Implications of Cetacean Culture, Boat-based Wildlife Watching, Live Captures of Cetaceans and Management of Marine Protected Areas within the EU Natura 2000 network. There is also a Large Cetaceans WG and Extension Area WG.

Of particular interest to NAMMCO, is the implementation work carried out within the framework of the Conservation Plan for Harbour Porpoises in the North Sea under the leadership of the North Sea Group (NSG). Norway is, as range state, represented in the North Sea Group. Data on by-catch rate in Norwegian fisheries operating in the North Sea are, indeed, necessary to the full assessment of the impact of by-catch on the North Sea harbour porpoise population.

Conclusions of the NSG were that monitoring of marine mammal by-catch in the North Sea remains inadequate. Proper data were still lacking for a reliable impact assessment, because of inadequate and unsufficient monitoring of the various net fisheries. The data at hand indicate, however, that by-catch rates in some fisheries may be above any proposed reference limits, although uncertainty is large. Better quality data on by-catch rates and fishing effort for net fisheries was required from EU Member Countries before this assessment could be refined and conclusions drawn as to the overall by-catch of harbour porpoise in the North Sea. Other approaches that could be appropriate for assessing the impact of by-catch should continue to be explored further such as taking a risk-based approach.

New information on matters relevant for small cetacean conservation was received from various sources. Several points concerned the Faroes catch of pilot whales. The ASCOBANS Secretariat requested further guidance from the AC regarding contacts with the Faroese authorities concerning the taking of cetaceans. The UK Ambassador to Denmark had recently visited the Faroe Islands and had asked for information about the sustainability of the hunt. The Netherlands informed that the Dutch government opposed the hunts as they were currently being conducted and consideration was being given to broadening the remit of the IWC to cover small cetaceans. It would contact Denmark and the Faroes for expressing its view that the killing of small cetaceans was not acceptable. M. Simmonds (Humane Society International) suggested that ASCOBANS should maintain contact with the Faroese authorities and seek information about the hunts and the utilization

of the meat, pointing out that dolphins as well as pilot whales were taken. Germany noticed that at least some of the Faroese cetacean populations were shared with ASCOBANS.

Two actions points related to the Faroese catch were adopted

- The Secretariat would contact the Faroese Authorities with a request to provide information on recent hunts, in particular details regarding the species affected by the hunt, how sustainability is assessed, what regulations and management are in place, and how the catches are utilized.
- Parties should ask the EU Presidency to write along similar lines to the Faroese Authorities, raising concerns that some of the populations affected extend into European waters.

Of potential administrative interest, mention was made of cooperation with ACCOBAMS, CMS, OSPAR, HELCOM, EU institutions and other stakeholders. A collation of meeting dates of relevance to ASCOBANS in the coming calendar year and appointment of observers was agreed.

The Netherlands offered to host the 22nd Meeting of the Advisory Committee and associated meetings, probably in the week beginning 28 September 2015.

Agenda Item 5.3: ICES Observer's Report

REPORT FROM THE 2013 and 2014 ACTIVITIES IN ICES

Tore Haug
Institute of Marine Research, Tromsø, Norway

ICES WGMME

The ICES Working Group on Marine Mammal Ecology (WGMME) met in Paris, France from 4–7 February 2013.

- In 2009, ICES requested that WGMME "Develop a framework for surveillance and monitoring of marine mammals applicable to the ICES area that is realistically achievable by contracting parties". This remained a term of the Terms of Reference (ToR) for the WG in 2010 and development of this work into a Cooperative Research report (CRR) was approved by ICES in 2011. Subsequently, due to continued slow progress during 2012, the decision was taken, in consultation with ICES, to withdraw the proposed CRR until such time as progress justified submission of a new proposal. During the meeting it was decided to refocus the report on the monitoring requirements for the common indicators identified by ICG-COBAM which could potentially contribute to OSPAR Joint Assessment and Monitoring Programme (JAMP) for biodiversity monitoring.
- Requests from the European Commission and OSPAR on the development of indicators and targets for determining Good Environmental Status (GES) under the marine Strategy Framework Directive (MSFD) and building on work undertaken in 2012, management units were further reviewed and delineated for cetaceans. Boundaries were specified so that the management units can be populated with abundance and by-catch estimates. As previously agreed, these boundaries coincide with ICES Area/Division boundaries where possible. It was not possible to provide a similar consideration of seal management units. Linked with this, further consideration was given to ICG-COBAM's common indicators for marine mammals. The proposals were accepted in principal but some changes will be required to make them operational.
- Current monitoring efforts to determine the distribution and habitat use of marine mammals, in relation to environmental impact assessments, e.g. for marine renewable energy developments, typically take place at much smaller spatial scales than are ecologically relevant to marine mammals, and are often undertaken independently without broader coordination. This results in numerous disparate datasets that are difficult to integrate when assessing overall impacts of marine renewable energy developments. Case studies were provided for Germany, The Netherlands, Belgium, and UK. A need for strategic decision-making in the early stages was identified. In the initial monitoring design stages, regulators and developers must develop clear, achievable monitoring objectives, and design realistic ways to achieve them, so that robust scientific data with sufficient statistical power can be gathered given available resources. There is also a critical need to improve integration of data collection efforts

throughout the lifetime of a project, thereby ensuring that data gathered during pre-consenting *site characterization* stages can act as the "before" dataset for later studies of *magnitude of impact*. This requires that BACI / BAGI or other suitable approaches be adequately considered and evaluated with respect to statistical power at, or near, the outset of site characterization data gathering. Too often, monitoring programs in adjacent marine renewable energy developments occur independently without broader coordination. Regulators and seabed owners need to acknowledge the need for data pooling, require it as an integral part for marine renewable consenting and develop internationally standardized comparable data formats for easy access and analysis. The Joint Cetacean Protocol (JCP) may serve as such an example.

In 2014 the WGMME met at Woods Hole, Massachusetts, USA from 10–13 March. A satellite meeting was held in Oban, Scotland, UK simultaneously (from 11-13 March), and during plenary, the two meetings were linked through video skype. Eight ToRs were address, two of which were special requests from OSPAR.

- The first reviewed new information on population sizes and population/stock structure for marine mammals in European waters.
- The second reviewed similar information as well as work on the incidental capture of marine mammals in the western North Atlantic (the latter specifically covering North Atlantic right whale, harbour porpoise and white-sided dolphin).
- The third ToR reviewed the further development of the By-catch Limit Algorithm framework for determining safe bycatch limits and included a comparison with approaches used to assess bycatch in USA.
- The fourth ToR, to review the applicability of the Joint Cetacean Protocol (JCP) for European reporting requirements such as MSFD and the Habitats Directive, could not be fully addressed due to continuing delays in the publication of the JCP.
- The fifth ToR reviewed the development of database for seals and its potential contribution to the operationalization of MSFD indicators.
- The sixth ToR reviewed approaches to marine mammal survey design used during pre-consent data gathering and post-consent monitoring in the offshore marine renewables (wind, wave, tide) industry.
- The seventh and eighth ToRs addressed two special requests from OSPAR. The first on interactions between aquaculture and marine mammals, including the identification of the pressures and impacts which have sufficient documentation to necessitate the implement of relevant monitoring, and to outline examples of effective management and mitigation solutions. The second special request was for the provision of technical and scientific advice on options for ways of setting targets for the OSPAR common MSFD indicators for marine mammals and to provide examples of the application of these options. The advice also considered target setting options, the consequences that these may have for the monitoring programme (including spatial and temporal implications) and also the precision necessary in target setting and monitoring.

Building on earlier requests from the European Commission and OSPAR on the development of indicators and targets for determining Good Environmental Status (GES) and work undertaken in 2012 and 2013, management units were further re-viewed and delineated for cetaceans and seals. Boundaries were specified so that the management units can be populated with abundance and by-catch estimates, where appropriate. As previously agreed, these boundaries coincide with ICES Area/Division boundaries and/or OSPAR boundaries where possible. Much of the current surveillance and monitoring of marine mammals in Europe will potentially contribute to MSFD monitoring programmes/indicator assessments. However, to be successful, monitoring programmes require clearly defined objectives, good design (based on power analysis) and well-articulated reference points/targets and indicators. In addition, there should be a well-defined mechanism to translate results into management actions to meet and policy objectives and a feedback mechanism to evaluate the success of the process. Targets need to be set in relation to reference levels and conservation objectives, while recognising the limits of statistical power to detect change based on logistically feasible monitoring.

ICES WGBYC

The ICES Working Group on By-catch of Protected Species (WGBYC) met in Copenhagen at ICES Headquarter from 4-9 February 2013. Since the group started as Study Group on Bycatch of Protected Species (SGBYC) in 2008 the broad aim of the meeting is to collate and review recent information on the by-catch of

protected species, especially under the requirements of European Commission (EC) Regulation 812/2004, to coordinate by-catch monitoring and by-catch mitigation trials and to disseminate and review information on methodologies associated with these topics. The group recently refocused the aim to work on the incorporation of monitoring requirements into the new Data Collection Framework (DCF) since the EC decided not to amend EU Regulation 812/2004 and to implement monitoring tasks for protected and endangered species in the future in the DCMAP by close cooperation with ICES expert groups (Planning Group on Commercial Catch, Discards and Biological Sampling/ Study Group on Practical Implementation of Discard Sampling Plans; PGCCDBS/SGPIDS and Regional Coordination Meetings (RCMs). This objective is consistent with a move to a wider ecosystem based approach to fisheries monitoring to include by-catch of cetaceans, seals, birds, turtles and non-target fish species.

Abundances of cetaceans, DCF catch and discards monitoring, and monitoring effort under the current Regulation 812/2004 were put together in a database to facilitate an overview of current gaps and overlap in monitoring. Furthermore, WGBYC reviewed and commented on EU Member States' reports under council Regulation 812/2004 to assess the status of information on recent by-catch estimates and evaluate the extent of the implementation of by-catch mitigation measures. It was noted that estimates are still very patchy, and several EU member states have not fulfilled their monitoring obligations. By-catch monitoring remains less than optimally directed in many cases. Observer effort may not be representative of fleet effort and any extrapolated numbers derived solely in this report are uncertain and should be treated with caution.

WGBYC reviewed recent by-catch mitigation trials, including trials of gillnet modifications and experiments that attempt to quantify the effect of "pingers" on porpoise displacement. Similar to previous assessments, implementation of by-catch mitigation measures was also found to be patchy, with few EU member states able to provide unequivocal confirmation that the obligations under Regulation 812/2004 for "pinger" deployment are being met. WGBYC continued to develop a streamlined and effective database for the collation, storage and analysis of European by-catch monitoring and fishing effort data for those fishing sectors where by-catch monitoring is mandated under Regulations 812/2004.

In 2014 WGBYC met in Copenhagen at ICES headquarters between 4-7 February. One significant aim of WGBYC continues to be the collation and review of recent annual information on the by-catch of protected species under the requirements of EC Regulation 812/2004. This is in addition to the continued coordination of by-catch monitoring and mitigation trial data, and the review and dissemination of information on methodologies associated with these broad topics.

As WGBYC continues to compile and assess data from Member State reports under Regulation 812/2004 and/or from the DCF, information available to identify fisheries with incidental catches of cetaceans and where further mitigation measures are needed is currently still limited. Furthermore, it does not necessarily allow any accurate or precise assessment of the impact of incidental catch on most cetacean populations. However, there are some data that have proven useful for a preliminary evaluation of the potential impact fisheries by-catch may be having on certain cetacean and protected fish populations. In addition, changes to the design of the DCF are expected to be adopted in 2015. Changes will stipulate minimum requirements for monitoring of target and non-target species (including protected species) with greater plasticity at the regional level for tailoring monitoring to meet the needs of Member States, national and wider European obligations. The extent to which these new developments will impact future quantity and quality of data available to WGBYC for evaluating levels of by-catch for various protected species is unknown.

A preliminary evaluation of estimated by-catch rates for North Sea Harbour Porpoise was conducted where expected by-catch rates were compared to four different thresholds to evaluate possible risk to this management unit. Without any measure of uncertainty, preliminary results of the by-catch risk approach (BRA) show that North Sea Harbour Porpoise may be near or above sustainable removal levels. WGBYC is still awaiting guidance from the EC on setting target removal levels for protected species so impacts from fisheries interactions can be fully evaluated. WGBYC agreed to continue with the BRA focusing on how to incorporate uncertainty into the assessment where possible.

ICES WGHARP

The ICES Working Group on Harp and Hooded Seals (WGHARP) met during 26-30 August 2013 at the

Knipovich Polar Research Institute of Marine Fisheries and Oceanography (PINRO) in Murmansk, Russia, to consider recent research and to assess the status and harvest potential of harp seal stocks in the Greenland Sea and White Sea/Barents Sea and of the hooded seal stocks in the Greenland Sea. The basis for the advice was a request from Norway in September 2012. The WG received presentations related to catch (mortality) estimates, abundance estimates, and biological parameters of all the stocks in question. Additionally, the WG received and reviewed information on the Northwest Atlantic harp seal stock.

ICES ASC

The 2013 ICES Annual Science Conference (ASC) was held in Reykjavik, Iceland, 23-27 September 2013. The conference included no particular theme session devoted entirely to marine mammals. Nevertheless, some sessions were designed with marine mammals included as an integral part - relevant sessions were: "Responses of living marine resources to climate change and variability: learning from the past and projecting the future", "Marine spatial planning: The multidisciplinary approach", "Identifying mechanisms linking physical climate and ecosystem change: Observed indices, hypothesized processes, and "data dreams" for the future" and "Advances in studying spatial distribution".

In 2014, the ASC was held in A Coruña, Spain, 15-19 September. This conference included relevant titles such as: "The science and tools for the management of networks of Marine Protected Areas", "One size does not fit all – what does an integrated ecosystem assessment mean to YOU?", "Fish tales from the past: Using sub-fossil, fossil, and prehistoric structures to describe past marine populations and oceans" and "Arctic biodiversity under climate change and other stressors". One session, theme session J ("Climate change: Back to the future for marine predators"), was particularly devoted to top predators including mammals.

Session J had been suggested by the ICES Working Group on Harp and Hooded Seals (WGHARP) who had made observations of possible effects of climate change on the populations of harp and hooded seals in the North Atlantic. In recent years we have seen expert reviews from the Intergovernmental Panel on Climate Change (IPCC) showing that climate change will induce temperature changes and associated adjustments in ocean circulation, ice coverage and sea level. Such changes will affect life-history parameters of marine top predators (mammals, birds, large pelagic fish) via changes in habitat features, e.g., ice cover and availability of food resources (bottom–up effects), or will alter the role that predators play in marine ecosystems (top-down effects). Theme session J intended to focus on presentations that show how environmental change has affected life-history strategies among large marine predators in the past, or how environmental change may affect the role that these species play as top-level predators in marine ecosystems in the future. The session included 13 oral presentations and one poster.

One of the mammal studies, involving grey and harp seals, showed how predation on commercial, well-monitored fish species may be radically influenced by alterations in abundance of other important forage and non-commercial fishes where information about abundance may be sparse. Such changes may particularly impact predator condition, with potential implications for changes in life history and population dynamics. It is generally assumed that change in forage fish distribution will trigger change in predator distribution. Results from joint Norwegian-Russian ecosystem surveys confirms this in that both forage fishes and several whale species tend to be distributed further north in the Barents Sea now compared to only a few years ago. The ecosystem surveys and other surveys with combined marine mammal observations and resource mapping using acoustics and trawls have facilitated more sophisticated understanding of associations between prey and predators. Thus, in the Norwegian Sea killer whales have been observed to be closely associated with the now very abundant mackerel in the area. Baleen whales, such as fin and humpback whales which were previously associated with krill and pelagic fish species, now appear to be associated with high and dense concentrations of juvenile cod and haddock. As in the Barents Sea, also cetaceans in the Norwegian Sea appear to be distributed further to the north now than a decade ago, probably as a result of changes in zooplankton concentrations and more northerly distribution of relevant forage fishes.

Seal species dependent on sea ice for reproduction would be expected to be particularly sensitive to climatic change. One study of harp seals in Canada demonstrated that in addition to direct mortality of pups, due to unseasonal break-up of sea ice, fecundity has also been reduced by an increasing frequency of late-term abortions. Abortion frequency again was linked to both capelin abundance and the amount of first-year ice,

but it was suggested that ice cover in this context acted as a proxy for prey availability. For another ice-associated species, the hooded seal, population size in the Greenland Sea has been reduced to a small fraction of historical levels due to past unsustainable harvest. This would be expected to lead to improved fecundity due to release from density dependence, but no decline has been observed in the age of primiparity. This lack of improvement could be due to deteriorating feeding conditions in the area.

More information is available at the ICES website www.ices.dk

Agenda Item 5.4: Canada/Greenland Joint Commission on Conservation and Management of Narwhal and Beluga (JCNB)

The Catch Allocation Sub-Group of the NAMMCO-Joint Commission on Narwhal and Beluga met in Copenhagen on 10–12 March 2014 with the main purpose of developing an allocation model that will provide a mechanism for assigning harvested animals (narwhals) to summer stocks. A summary of the report describing the preliminary model is discussed in Agenda Item 8.6.2 and provided in Annex 1. The Catch Allocation Sub-Group will meet to finalise the model in March 2015, with the full Scientific Working Group meeting directly afterwards.

ANNEX 1: Report of the T-NASS2015 joint technical, planning, and steering Meeting

Copenhagen, DK, 1-3 Oct 2014

1. WELCOME AND CONVENOR'S REMARKS

Prewitt informed the group of a few logistical matters. Chair Gunnlaugsson welcomed the group (Appendix 2).

2. ADOPTION

The agenda was adopted (Appendix 1). Documents provided are in Appendix 3.

3. RAPPORTEURS

Prewitt was appointed as the rapporteur, with help from participants as needed.

4. SUMMARIES BY JURISDICTION

4.1 Iceland

The proposed budget included ¾ of the amount originally included in the T-NASS2015 proposal. This reduction applies to both the National and Extension surveys.

4.2 Faroe Islands

The Fishery Ministry has put 1.6 mil DKK for a ship based survey (one vessel and 8 observers) in the proposed budget for 2015. The proposed budget also included an additional 1 mill DKK for extension. The budget was presented 1 October 2014, and the decision will come probably by December.

4.3 Greenland

Greenland has applied for the funding for their National surveys through the Greenland Institute of Natural Resources and about 900 thousand DKK has been included in the Greenland Government budget for 2015. The budget is expected to be approved before the end of 2014.

4.4 Norway

The situation in Norway is similar to Greenland, National surveys through the institute and then extension survey outside of the institute. The national survey would cover the EW *Small Area* (IWC terminology) which includes the Norwegian Sea from the coastline to 3°E in the northern part and around Faroe Islands in the south. The WG awaits confirmation that the Extension (Jan Mayen) was included in the proposed budget (outside of the IMR).

Other Areas:

EU/UK

The proposal for SCANS-III to survey all European Atlantic waters (shelf and offshore) in July 2016 will be submitted to the EU LIFE Nature programme on 16 October 2014. A decision is expected in early 2015.

Canada

The next Canadian cetacean surveys will likely occur in 2017.

USA

The US is planning a full-scale cetacean survey in 2016. A few aerial surveys may be done in 2015, but likely not during summer.

T-NASS2015 Summary

With the current status of plans and funds, there could be a gap in coverage between Iceland and Greenland which is a very important area for obtaining distribution patterns and abundance estimates for common minke whales. A primary objective for T-NASS2015 is to obtain complete abundance estimates for common minke whales in the central area of the North Atlantic.

The WG agreed that it might need to have options in place in the case that funding does not come through.

> *Plan A*: If Norway gets Jan Mayen funding, then T-NASS2015 should focus on common minke whales covering the central areas.
>
> *Plan B*: If Norway does not get Jan Mayen funding, Iceland will focus more on fin whale survey effort (surveying further south which will leave central areas uncovered). It may also be chosen to re-schedule the aerial survey of East Greenland to expand the covered area in West Greenland instead. The Faroes may also consider conducting their survey in 2016, together with the SCANS III survey (if funding is approved).

The group pointed out that if Plan B applies, the 2nd of the three objectives for T-NASS2015 concerning minke whale abundance, is no longer possible to achieve.

5. VESSEL-BASED SURVEYS

5.1 Vessels and timing

In Iceland the plan is to use 2 or three survey vessels: one would also be doing a mackerel survey in July and beginning of August with sufficient room for double platform observers. The mackerel survey vessel would survey cetaceans only during steaming and cover the Icelandic economic zone including roughly 1/3 of the Jan Mayen extension survey area. The survey in 2015 is being planned to better cover the north part of the economic zone than in 2014 and will also partly cover the area off East Greenland. Depending on special funding Norway will survey the remaining part of the Jan Mayen area. It is not clear yet to what extent the mackerel survey will cover the East Greenland area. It is unlikely that there will be an Icelandic participation in a redfish survey. There is interest in using the other Icelandic research vessel, which would otherwise be out of function, but is good for whale surveys and would be used probably towards the south.

Timing

The Faroese survey may be delayed for about 2 weeks.

Norway will survey the "EW" area, during the same time period (i.e. July) as in previous surveys such as the TNASS-2007.

5.1.1 Platforms of opportunity

Other national mackerel survey vessels will unlikely have space for double platform observers, but dedicated cetacean effort on these vessels would be valuable for distribution outside the NASS survey area and to detect shifts in distribution. The group also stressed the importance of dedicated cetacean effort on redfish survey vessels for this purpose. It could also be helpful to have marine mammal observers on the redfish surveys from other nations.

For the Faroese mackerel survey, if the Faroese research vessel is the only vessel, there is no space for marine mammal observers. Last year one of the commercial vessels was chartered for doing part of the mapping survey, which will have room for a full set of observers. It is unclear at this stage if the commercial vessel will participate in the survey in 2015, but if it does, it would give the opportunity to have marine mammal observers on that vessel.

The Ecosystem Surveys in Norway did not have dedicated marine mammal observers on this year. It would be helpful if there were dedicated observers on future Ecosystem Surveys.

Nils will send this report to the Ecosystems group and point out the recommendation. Gunnlaugsson will send the report to the ICES Redfish survey group and the separate mackerel group (ICES) WGINOR.

5.2 Survey design

5.2.1 Stratification

Survey stratification will depend on whether Plan A or B must occur (whether Jan Mayen is funded or not). For ship-based surveys the WG further discussed whether one should consider using the same tracklines (which makes trend analysis more intuitive), or different tracklines (which is preferred for design based survey abundance estimates). Previous NAMMCO recommendations have emphasised that stratification should be made in a way which makes trend analysis feasible.

For aerial surveys it may be more practical and efficient to follow an entirely systematic design in which case trackline designed in the past are likely to be repeated in 2015.

5.2.2 Effort allocation

It is critical to know whether Jan Mayen is funded or not in deciding on effort allocation. The group stressed that the area around Jan Mayen is very important if common minke whales are a primary objective. Without this area the survey is not a complete, synoptic one and misses key areas.

Last year the funding for the regular Norwegian surveys was given on 8th January. The 2015 governmental budget will be put forward on 8 October 2014. The NAMMCO Secretariat will contact Ole David Stenseth for updates on whether the Extension survey was included in the proposed budget.

If/then scenarios: If Jan Mayen is not covered, then shift the available funds towards the pilot whale and fin whale surveys and an abundance estimate for common minke whales in the central part of the North Atlantic may be difficult to obtain (Plan B).

5.2.3 Transects

Past surveys have used the tracks given by Distance.

Norwegian surveys use new sets of transects in each survey.

5.3 Field methodology

The group discussed whether Iceland should use the Norwegian method.

A problem last time in the Icelandic surveys was that there was little overlap of the primary minke whale sightings close to the vessel and the tracker sightings far from the track, with few duplicates.

Hammond pointed out that the tracker method is generally used to account for responsive movement. This has not been identified as a significant problem with the primary species in the T-NASS2015 survey (common minke whales, pilot whales and fin whales). Palka stated that their surveys use IO method. They investigate responsive movement using post-stratifying the data for far and near sightings (see Palka and Hammond 2001). In order to post-stratify in this way, searching must be done using high-powered binoculars to get sightings at greater distances.

Perhaps best method for Iceland is a 2 independent observer platform configuration. Some pros are that data collection is easier, and does not need communication between the observers (which requires more equipment and has the potential of parts not working). Duplicates could be identified afterwards during post processing, or have someone identifying duplicates in the field (although this would require using a third platform for the duplicate identifier). Norway uses automatic duplicate identifying afterwards (for common minke whales, based on tracking histories). Palka uses computer assisted duplicate identification using predictions of where whale would be during the second sighting. Norway records surfacings, Palka uses sightings.

For distance estimation, Norwegian surveys use naked eye estimation, and use training and experimentation to verify distances. Icelandic observers are generally not as experienced as minke observers, and it would probably be better to use binoculars with reticules to get distances.

Palka is doing multiple species surveys, using an IO mode configuration, and this method would probably work well for Icelandic surveys for both minke and fins. Palka prefers using high powered binoculars, which

allow for more opportunities to identify species further off and post stratifying data for far and near sightings for looking at responsive movements. The surveys use 2 IO teams, and are not focusing on individual species.

Norwegian method is not great for fin whales due to difficulty with species identification and because searching is done with the naked eye, focussed close to the vessel. They are trying to fix this by giving the task of identifying species for distant sightings to the scientists in the bridge. The main observers are focussed mainly on searching for minkes and spending their time tracking.

The group recommends that Iceland should use a method that is more applicable to multi-species surveys than the Norwegian method. Recommendation is to **use IO, double platform method.** Use of big-eye binoculars is not planned, but use regular power binoculars during searching (as in the last survey) and some use of medium powered binoculars should be considered, in particular for species ID.

Icelandic surveys may close in on pilot whale groups, and large baleen whales for species ID, however closing in should not occur in areas of high density of minkes and fins. Icelandic surveys will not use cues as sighting units for large whales, but will still try to get resightings of surfacings. Iceland will consult with Palka on specifics of logistics in the field and her field protocols.

For surveys in the Faroes, they will use the IO method, and use whales or groups instead of surfacings.

5.3.1 Searching strategies - platforms, binoculars

Both Iceland and the Faroes will use the double-platform, IO method.

Palka's surveys have 2 observers using big eyes, and no cameras. Another observer is a recorder that is searching through naked eye (peripheral vision). They use 2 independent teams, and are not using tracker method. The WG discussed whether cameras would be helpful in this type of situation, or if it is a lot of extra effort for not much gain. The group discussed the system developed by Leaper, which included video measurement of distance triggered by a sighting button. This system worked fairly well while the equipment was working and then distances were obtained for approximately 50% of sightings. There was also a minicam attached to binoculars pointing at lines on the deck that was triggered by a sighting button which worked very well (measured angles for 90+% of sightings).

5.3.2 Drones and Kites

5.3.2.1 *Group size*

Drones

The plan would be to use a quad copter drone which allows for track design in real time, collection of video, and post analysis. Video could be used as a verification of angle and distance measurements, and group size estimation. The drone would be deployed when a large group is encountered. This would likely require that the ship stop, perform delayed closing, and observers off-effort, while the drone is deployed to obtain group size. A decision must be made how much time would be devoted to delayed closing/drone deployment.

A primary question is, if group size estimates are obtained, how are these data used in the analysis? In addition, if independent average group sizes are obtained separately from the survey, perhaps they can be both spatially and temporally be applied to the survey data? The group agreed that it may not be acceptable to extrapolate group size from one area to another, but it could be possible to develop a correction factor to be applied to group size estimations from the survey. The WG agreed that if the drone can take video of individual subgroups, this would help get better group size estimates, however it should not be used to get an average group size estimate.

Palka informed the group that during their surveys, when they encounter lots of small groups of pilot whales moving in different directions— "super schools"— the recorder keeps track of where all the little groups are as they go by. They do not stop because this often makes it more difficult to keep track of the small groups. Perhaps drone or helikite could see how the groups are moving around better.

If the Faroes decides not to use drones or helikites, the default would be to handle the situation in the same way as Palka and NASS have done in the past, with keeping track of small groups.

Other idea is to handle the data in a similar way that Heide-Jørgensen did with humpbacks during an aerial survey in Greenland. They treated the larger group in a separate strip transect estimation, then added it later to the line transect survey. Perhaps a similar analysis could be performed with pilot whale super groups.

Helikites

Helikites (e.g., www.allsopp.co.uk) are helium filled kites/balloons which are connected to ship via a cable and can carry video recording equipment on it. These may provide another platform which is higher than ship deck (ca 1000 ft) and could record video of the trackline. This is a completely new survey technique, it is unknown whether they would work in this application, and would require a fair amount of testing. Concerns include how stable it is while the ship is underway, what kind of view the video would give, etc. Presumably the helikite gives wider field of view than the shipboard observers. There is a possibility that this would help with group size estimation, and could potentially be used to verify distance measurement. The helikite could almost act as a hybrid aerial/ship survey.

The realities of using the helikite must be considered. Currently the T-NASS2015 survey is only 9 months away, leaving a relatively short amount of time for testing and development. It is important to consider what survey problem this technique is aiming to solve, and if it is a big enough problem to warrant spending the time on investigating the helikites usefulness. The main application of the helikite would be to aid in group size estimation, which has been pointed out in all of the previous surveys as a problem with the data. Problems in past occurred because observers handled estimating group size in various ways, which was not always consistent and added a large amount of variability. This problem could be solved with the helikite, in the past attempts have been made to avoid this by providing very specific instructions to the observers.

Another application of the helikite could be to obtain information on availability bias, however, the video quality would have to be high.

If T-NASS implements IO, using binoculars to get multiple sightings of groups is important to get better group size estimates. Observers would get initial sighting, but as they get closer drones and/or helikites could be used to get updates on group size and species ID, and that data could be used to correct information on the initial sighting.

The Faroes will take charge of looking into drones and helikites and will follow up and see what is feasible.

5.3.2.2 *Independent platform?*

Whether the helikite can be used as an independent platform needs to be discussed.

5.3.2.3 *Testing protocols*

The group needs detailed testing protocols for both drones and helikites.

5.4 Sighting protocols

Iceland and the Faroes will follow a delayed/partial closing method to get species ID.

If using binoculars, there must be very firm protocols to make sure observers keep consistent search patterns, since it is likely easier to define search sectors with the naked eye, and have better peripheral view.

5.4.1 Fin whales (large baleen whales)

Fin whales frequently overlap with sei and blue whales and can easily be confused, therefore species ID is important.

In 2001, surveys closed on a few for species ID, but this is time consuming.

In 2007, ships did not deviate from track very much. They slowed down, went off effort, stopped or partially closed and everyone tried to get species ID and number. This did not take much additional effort and worked fairly well. Recommend doing this, but not during high density and only sightings within a reasonable distance from the track should be considered.

SCANS and CODA protocols included different ID categories, or observers recorded a level of certainty of the observer on the species ID. A misunderstanding resulted in one vessel implementing this protocol differently, which caused problems with analysis. Care must be taken to ensure that all vessels and observers are using the same method.

5.4.2 Pilot whales

Iceland should consider delayed closing in on pilot whale sightings. Some time-off effort for mapping out super groups may be worthwhile.

A preliminary protocol would be to describe sub-groups as individual sightings, as has been done in previous surveys. After the initial sighting of the group, the observers would go off- effort, close in and get better numbers. Another option is to continue on the line, but slowing down to half speed to get better estimates of group size.

Palka has these general guidelines: if a large group (a few hundred animals) is sighted they go off effort and divide up group to estimate group size. Observers work in groups, some pointing out new animals seen, others recording. They also try to identify calves. This could be considered delayed closing. They are using the IO method, but sometimes stop to get species ID and group number.

Because T-NASS has not used IO before, it would be advantageous for Iceland and the Faroes to collaborate with Palka to see Palka's protocols and observer's manual for ship-based surveys. Palka agreed to collaborate and share information and emailed her information.

5.4.3 Minke

Iceland plans to record each surfacing of a suspected minke whale: once a minke whale is sighted, they will track the individual whale until it is abeam. This will leave open the possibility of using the Norwegian analysis method. Focusing on tracking individual whales may compromise searching for fin whales but there is little overlap of these species.

5.4.4 Sperm

Sperm whales are not a primary target species for T-NASS2015, and extra effort spent on sperm whales must be carefully considered.

The recommendation is to monitor whales within 1 km of the trackline until they fluke. They will generally have little overlap with other species, therefore it should not take away effort from spotting other species.

In 2007, acoustics were used for sperm whale detections, but acoustic detections were too few to give an abundance estimate. Acoustics are usually robust for sperm whales but in 2007 there were only 11 detections acoustically, compared to 100 visual sightings. Low acoustic detections was likely due to high noise of vessel, but vessel will likely be the same one in 2015. For the next survey, the recommendation is to record the sightings in such a way that it will allow for abundance estimation corrected for availability.

Palka informed the group that they use both visual survey and passive acoustic array monitoring. They are working on combining the visual and the acoustic surveys, so that the acoustic monitoring could be used as an independent platform to the visual survey.

5.4.5 Other

For dolphin species identification, it is important to have experienced observers. For groups of dolphins, the recommendation is to use same method as pilot whales, but without closing. It is not a priority to get a good abundance estimate for dolphins, so it is not worth the extra effort that it would take to close on the groups. If it is possible to get the data for an abundance estimate, then that is good, but it should not be done at the cost of losing effort on the target species.

T-NASS-07 data was sufficient to give an abundance estimate for bottlenose whales, and it would be ideal to get this level of data again.

For sightings classified as unidentified species, one option is to make abundance estimate for unidentified sightings and then apportion them into the various species. The WG was unsure whether this was acceptable to the IWC.

5.5 Data collection

The group discussed that Iceland and the Faroes may use audio recording of observer sightings data, similar to the Norwegian method. They may investigate video recording for distance estimation (similar to the system developed by Leaper of SMRU, which uses video recorded around the sighting, analysed later to get distance.

For 2015 survey, one possibility is to record all audio in the field, and enter data later with post-processing. Iceland and Faroes would need to purchase the equipment, and will discuss the technical info with Nils outside of the meeting. As discussed under item 6, it may also be possible to use the updated "Redhen" system that Greenland is using for their aerial surveys during shipboard surveys.

For distance estimation, Palka reports that e-ranger is not working for them because it is not accurate enough. The binoculars with reticles work out fairly well, especially if people are trained. They are also looking into a cheaper inclinometer, but have not tested it. Their angle measurements are not automated.

Hammond informed the group that the SCANS-III proposal includes work to redesign the data collection system, but this would be only in time for their survey in 2016. They will not start working on developing the system until July 2015 (contingent upon funding from EU).

PAMGUARD is another option for a data collection system. It was developed for acoustics but can be used for visual sighting data collection as well.

5.5.1 Effort recording

Same as above.

5.5.2 Sightings recording by observers

Palka informed the group that during their surveys, one person is dedicated recorder and observers relay their observations to the recorder. Some observers also keep their own databooks. The recorder is responsible for obtaining the angle from the angle board. The data is verified every evening. For species ID, they allow observations to be corrected the next day.

For Norwegian surveys, there is a computer on the bridge with cables to the platforms, where there are microphones. For a sighting, the observer picks up the microphone and pushes button which starts the audio recording. In the evening they listen to the audio recording and fill out datasheet. It is important to review the data quickly to clear up any problems with audio clarity.

For T-NASS2015, it is important that the protocols say that all data should be verified on the same day.

5.5.3 Continuous/automatic sightings recording

The group discussed that it could be helpful to have continuous voice recording which makes it easier to review the recordings at a later time to correct/clarify data.

5.5.4 Acoustics

Faroes has the equipment from 2007, but it has not been used since then, and they have no experience using it. In addition, data collection methods have been further modified and developed. The hydrophone and cables are the same, but they would need to upgrade the front end (e.g., faster computer, new software). Gillespie can help a bit but cannot be fully responsible for building the system.

Palka suggested that passive acoustics for common minke whales could help south of Iceland. However getting funding for 2015 seems unlikely.

5.5.5 Equipment needs

Iceland and Faroese need good binoculars with good reticules, binocular poles with video recording and a gyroscope.

Headsets are not urgent because there will not be communication between observers but they may be convenient on noisy vessels. They need microphones for audio recording, including something to minimise wind noise, which could perhaps be something inside the clothes on the chest.

Special "sea-strong" computers may not be needed, if recording of sightings is only done on audio and transcribed in the evening on "normal" computer.

5.5.6 Software needs

There were no discussions of software needs (outside of the integrated systems which have their own software).

5.6 Cooperation on equipment and software development

SMRU can provide some help and advice for equipment, but for a 2015 survey, they cannot develop the whole system.

SCANS-III plans to update video recording system. Their aim is to develop a more efficient and robust data collection system which includes removing the complexity of wires everywhere and components that can fail. But this is planned for their survey in 2016, and will not be available for T-NASS2015.

Russell Leaper is one who developed their previous system, but he is busy and likely will not be available to help develop a system for T-NASS2015.

5.7 Cruise leaders and observers

The group discussed Iceland's and the Faroese's need for experienced observers. Palka has contact information for some of their observers, and will email this to Iceland. As for pay, they have 2 levels: very experienced observers are paid a bit more, and are often team leaders with more responsibilities. Other less experienced observers have a lower rate.

5.8 Training

Video of different species would be a helpful training tool.

Palka reported that their surveys have lots of repeat observers, but they do occasionally have some new people, or people with experience on different surveys. They prefer to have at max 1 out of 4 inexperienced observers, but it is usually closer to 1 out of 8. They have lots of on the job training, which includes having experienced people tell new observers how they collect the data. They use a cooperative methodology where the team works together to get group size. Other training methods are to have different people count separately and then compare the results from team to team. If the teams give different group sizes, they work that out in post processing.

The group recommended that since Iceland is using a method that they have not used before, they should have more intensive training. Palka informed the group that they start surveying while heading out to the actual survey area for training purposes, especially to get people used to searching, and how to enter data.

5.9 Experiments

The group discussed holding distance estimation experiments. Palka's experiments by having the ship stop, hold position, and point towards horizon. They deploy a small boat with a buoy and have observers use binoculars and naked eye to estimate distance. They hold one session of training with immediate feedback and afterwards they hold a test where they repeat the experiment but do not immediately tell the observers the exact distances. In addition to this being good training for the observers, they also use this info to see if need to calibrate distances and develop correction factors. They have used a correction factor in the past for distances for individual observers, but not for their most recent survey. Also, like Nils, they have looked at duplicates and compare distances. Biases depend on distances from the vessel- people are better at estimating distances closer to the vessel.

Øien noted that the Norwegians use similar experiments, and also look at duplicates to estimate variation in distances reported by observers.

For Iceland and the Faroes, should implement training for distance estimation for their observers. Testing may have limited utility (not collecting data that is useable), as test conditions are very different from survey conditions .

6. AERIAL SURVEYS

6.1 Equipment and software

Greenland will fly the Twin Otter and plans to use same protocols as previous surveys. They will be using an audio and video recording (Redhen system, more information below). If they encounter large aggregations, they go off effort (which takes a small amount of time, and is a good rest for observers), take pictures and then decide post-analysis whether to use the photos in group size estimations. They are flying at 700 ft, and some reaction to the plane has been observed (e.g., diving after passage of plane).

Iceland will fly the Partenavia and hopes to add camera to assist in IO and distance checking. Their plan is not to go through every image, rather, the main role of the camera would be to assist in being another IO platform and distance estimation. The camera could be used to set up a trial to see if observers saw same thing-estimation of $g(0)$.

Pike informed that a recent Canadian survey used 2 cameras slightly oblique, one on each side. They initially planned to use photos to give measurements (distances) that observers missed, such as when they encountered large groups of animals and the observers become overwhelmed and did not collect the distance data. This has not worked as planned because it has been impossible to match photos to sightings since the distances are critical in matching photos to sightings. This is probably not a problem in Iceland because it is not expected that they will be seeing such large aggregations. The Canadians are reading every photo. This is requiring 2 readers, and will take 1 year for 2 people to read all of them. The still photos have not been proven useful for group size estimation because some animals may be diving at instant photo was taken, and therefore can give lower group sizes than the observer. No objective way to tell if photo or observer had correct group size.

The still camera in Iceland would mainly be used for distance estimation, perhaps species ID.

Video may be a better option for Iceland to consider because easier/faster post-processing, easier detection of animals, better possibility to get group size, etc. The group recommends that Iceland contact the HighDef company in UK to see what their specs are. It is likely too expensive to use their system, but it could be useful to see what their system does and see if something similar can work for Iceland.

SCANS-III includes a component to test out high definition video methods for porpoise surveys in Kattegat/N Sea in spring 2016.

Recording systems

Palkas group uses the programme VOR- voice operating recording- which is the same programme as developed for and used in SCANS and other European surveys.

They are not using the circle-back method anymore. Instead, they use 2 teams look at perception bias, and a separate correction for availability bias. They are recording swim directions, and often see that they 2nd time around the animals are heading away from plane. Their surveys are flown at 600 ft (lower than Iceland and Greenland surveys, which are at 700 ft). They previously used circle back for 5 animals or less, which takes a long time. Another advantage of the two teams rather than circling back is that analysis is easier with 2 teams because one year's data is much more independent.

Palka's team did not use the audio recording part of the VOR system because they could not get to work. They record data on an external keyboard with 2 observers talking to 1 dedicated recorder. The VOR programme is run on a computer which is hooked up to a GPS so you can see the trackline, and points are added with sightings. The system is easy to use with the keyboard, mouse, and function keys. When they are off-effort,

their observers can use intercoms to talk to each other, and the pilots can listen to observers but cannot talk to observers.

Pike informed the group that in the Canadian surveys they used handheld digital voice recorders to record visual observations. The main problem with these was that they did not have clocks that record to the second, and therefore these had to be synchronised to watches and the GPS. A new recording was made on each transect (and re-synchronisation had to be done). The synchronisation was cumbersome and prone to errors. They did not have a dedicated data recorder. They did have 1 person that was dedicated to dealing with the camera systems.
The main point is that it is very important to have voice recorder with time stamp to the second. Ideally there would be an audio recording system integrated into the headset such that the intercom is on to talk to each other in the plane, and then the observers push a button for recording sightings. The system would use the power supply in the aircraft.

There was some discussion on whether the observers should be able to talk to each other. Although it is important for the observers to avoid alerting each other to sightings to remain independent, when they are off effort it is nice for them to be able to communicate.

Hansen described the systems that Greenland has been using, and a new system that they are considering for their next survey. This system is a new product from Redhen (http://r.b5z.net/i/u/10053748/f/RedHen_VMS-HDII.pdf) that is simpler, more reliable, records audio continuously, can handle both video and still photography, and integrates the data. The system needs a power converter for the plane, but otherwise is very small (e.g., roughly the size of 4 stacked iPhones), so would work on the Partenavia.

There is a possibility that the new Redhen system could be used for shipboard surveys as well, and would be able to record the camera system for distance estimation.

If this system looks like a good one to use, then NAMMCO could potentially arrange a training group. This training could potentially take place in Ottawa while Rikke Guldborg-Hansen is attending the JCNB-SWG meeting, which is only a few hours drive from Daniel Pike. NAMMCO would invite Daniel Pike to travel to Ottawa just before or after that meeting to go through the system with Rikke.

Along with the Redhen system, Greenland uses Bose QuiteComfort 15 headsets, Sony MP3 Linear PCM Recording with 2 sec prerecording. The also have still camera photography using Nikon D300 cameras.

The group also recommended that Iceland consider video recording. One option could be a GoPro, which is capable of 8 hours of recording and could be placed in the observer window in the very front of the cockpit or on the wing.

6.2 Availability
Equipment availability was discussed above.

6.3 Cooperation on development?
In the EU there is a company using HD video for seabirds, and they are interested in testing it for use on cetacean surveys as well. For SCANS-III, they plan on using this system in conjunction with sightings, and are developing methods to use this technology. There is a possibility that this could this be tested during the aerial surveys in West Greenland in 2015.

7. FUNDS

7.1 Available – allocation

7.2 Anticipated - allocation
Further discussion on funding will occur after budgets have been accepted in the individual countries.

8. PR

There is nothing to say at this time. This will be discussed further at the upcoming SC meeting.

9. NEXT MEETING

The group agreed to Skype in mid-December. Also, any updates should be given at the SC meeting (3-6 November 2014 in Bergen). It may be possible to meet for 1-2 hr before or during the SC meeting.

If we hear that funding has fallen through (e.g., if Jan Mayen has not been included in the Norwegian proposed budget), the group recommends that it holds an emergency meeting of the T-NASS Steering Committee to discuss how plans will change. This meeting could probably be a Skype meeting.

If funding comes through as planned right now, the Faroes and Iceland would need to meet again before the survey. If the Redhen system is going to be used, then this meeting could also be a training session. Possible timing for this meeting is the end of March (week 13). Key participants would include Gunnlaugsson, Vikingsson, Mikkelsen, Desportes (and Pike if Iceland is conducting an aerial survey).

Action Plan Table

Item	Responsible Person	Deadline
Drone plan	Mikkelsen	15 December
Helikite plan	Mikkelsen	15 December
VOR system- how it can be improved	Palka	Wait for Rikke's update on Redhen, late January?
GRLD data collection system- Redhen- can take 4 channels and GPS?	Hansen	15 December?
Can Redhen system be used in shipboard data collection	Mikkelsen	After Rikke's report on Redhen system, late January
Gyroscope- can it be used for recording angles on aerial and shipboard surveys	Prewitt will email Hansen, Pike and Palka	Email on 6 October, update at SC
Draft protocols for shipboard survey	Gunnlaugsson	End of November 2014 (reminder from Prewitt in mid-November)
Final protocols for shipboard survey	Gunnlaugsson	For March 2015 meeting
Final aerial survey protocols for Iceland (adapted from existing Greenland protocols)	Pike	For March 2015 meeting
Investigate whether there is space for marmam observers on mackerel survey in Greenland and Faroes (unlikely to use funds)	Gunnlaugsson/Mikkelsen	Await ICES planning group meeting results
Faroese mackerel survey effort- can full complement of observers be used (so get abundance estimates)	Mikkelsen	Update 15 December
Contact the HighDef company in UK to see what their specs and prices are	Gunnlaugsson	SC meeting
Vessel charters	Gunnlaugsson/Mikkelsen	Faroes- January 2015 Iceland (if necessary)- January 2015
Permission to enter EU waters (perhaps Norwegian waters as well)	Mikkelsen	January 2015

Appendix 1 Agenda

1. Welcome
2. Adoption
3. Rapporteurs
4. Summaries by jurisdiction
   - 4.1 Iceland
   - 4.2 Faroe Islands
   - 4.3 Greenland
   - 4.4 Norway
5. Vessel-Based Surveys
   - 5.1 Vessels and timing
     - 5.1.1 Platforms of opportunity?
   - 5.2 Survey design
     - 5.2.1 Stratification
     - 5.2.2 Effort allocation
     - 5.2.3 Transects
   - 5.3 Field methodology
     - 5.3.1 Searching strategies - platforms, binoculars
   - 5.4 Sighting protocols for
     - 5.4.1 Fin whales (large baleen whales)
     - 5.4.2 Pilot whales
     - 5.4.3 Minke
     - 5.4.4 Sperm
     - 5.4.5 Other
   - 5.5 Data collection
     - 5.5.1 Effort recording
     - 5.5.2 Sightings recording by observers
     - 5.5.3 Continuous/automatic sightings recording
     - 5.5.4 Acoustic?
     - 5.5.5 Equipment needs
     - 5.5.6 Software needs
   - 5.6 Cooperation on equipment and software development
   - 5.7 Cruise leaders and observers
     - 5.8 Training
     - 5.9 Experiments
6. Aerial Surveys
   - 6.1 Equipment and software:
   - 6.2 Availability
   - 6.3 Cooperation on development?
7. Funds- 3 October
   - 7.1 Available - allocation
   - 7.2 Anticipated - allocation
8. PR
9. Next meeting?

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Appendix 3 Document List

Document No.	Title	Agenda Item
SC/21/SPWG/01	Draft Document List	
SC/21/SPWG/02	Draft Agenda	
SC/21/SPWG/03	Draft Participants List	

Background Documents	Title	Agenda Item
NAMMCO-22-6	TNASS2015 Proposal	

SECTION 4 NATIONAL PROGRESS REPORTS

4.1 FAROE ISLANDS
PROGRESS REPORT ON MARINE MAMMALS 2013

By Bjarni Mikkelsen, Dorete Bloch, Maria Dam, Jústines Olsen and Geneviève Desportes.

I. INTRODUCTION

This report summarises research on cetaceans and pinnipeds conducted in the Faroe Islands in 2013. Research has been conducted by the Museum of Natural History, the Environment Agency and the Veterinary Service.

II. RESEARCH BY SPECIES 2013

II.a Species/Stocks studied

- Walrus (*Odobenus rosmarus*) – tagged animal
- Grey seal (*Halichoerus grypus*) – hunting statistics
- Pilot whale (*Globicephala melas*) – landed animals
- Sperm whale (*Physeter macrocephalus*) – stranded animals

II.b Field work

In 2013, a total of 270 "full samples" were collected from **pilot whales** by the Natural History Museum, from 10 drives - Viðvík on 21 July (34 samples), Fuglafjørður on 30 Juli (25), Sandavágur on 8 August (20), Leynar on 11 August (21), Húsavík on 13 August (20), Hvalvík on 27 August (51), Sandavágur on 6 September (20), Hvalvík on 22 September (20), Sandavágur on 10 October (21) and Hvannasund on 1 November (18). This is a continuation of a small-scale sampling programme. The future plan is to complement this with a comprehensive monitoring programme, one priority being age determination of all individuals. "Full sample" refers to recording/sampling total length, weight (if possible), sex, teeth, ovaries/testes and stomach as well as muscle, blubber, kidney and liver tissues. Foetuses are sampled when present.

The Environment Agency took samples of 25 **pilot whales** from the Fuglafjørður 30 July 2013 drive. The sampling included samples of muscle and blubber from 25 individuals, kidney from 21 and liver from 19. From a subsample of 12 animals, a liver sample was placed in liquid nitrogen for additional analyses. Also teeth from the lower jaw were extracted (by sawing off the outer section) from a number of individuals from this grind for age determination. At the drive kill in Sandavágur 8 August 2013, samples of muscle and blubber were taken of from 24 whales; liver and kidney and samples were taken from 23 and 21 individuals respectively.
At the grind in Sandavágur 10 October 2013, the sampling was focused on two organs solely; the eye and the ear. Samples (tissue samples as above in addition to what was supposed to be the thyroid gland) were taken from one adult female (286 cm long) only, and the head was taken to the Environment Agency in Tórshavn for dissection of the ear. The eye was samples on the request of a Canadian scientist who wanted to study the retina, and the ear was sampled in response to a study proposal from a Norwegian scientist. The efforts were largely wasted due to the custom at the US/Canada border that held the dry-shipper (nitrogen tank for transporting goods that must be kept deep frozen) for such a prolonged time (months) that the samples rotted and were thrown away.

Trials with a spinal lance as new hunting equipment in the **pilot whale** drive hunt have been performed for many years. The spinal lance is now adopted as legal equipment in the new executive order on pilot whaling from 5 July 2013 (see www.whaling.fo). The spinal lance is reducing the killing time to 1-2 seconds, while also improving accuracy and safety. Other equipment has also been tested. A blowhole hook has also been developed and from May 2015, only persons having attended a certified course of instructions in the whaling regulations and killing methods will be permitted to kill whales. NAMMCO has published an instruction manual on pilot whaling, both in Faroese and English (http://www.nammco.no/webcronize/images/Nammco/999.pdf).

On 27 February 2013 a **walrus** was observed in Svínoy. On 3 March the same animal was observed in Orkney and again on 9 March in Norway. On 21 March the walrus turned up again on a sandy shore near Sørvágur on Vágoy. Here, the animal was tagged with a satellite transmitter, by the Museum, in co-operation with the Greenland Institute of Natural Resources. For the next 78 days the walrus was tracked in the waters of the Faroe Islands, where it stayed in fjord areas but also made longer trips to the Faroe Plateau and Norwegian Sea. After the satellite transmitter had stopped in June the walrus was observed in Iceland. On 4 September the walrus was back in the Faroe Islands where a new transmitter was deployed. Thereafter the animal moved to east Iceland, where it was fairly stationary in the fjords, but again made some trips to more offshore waters in east and north Iceland as well as to the Norwegian Sea. In early January the animal moved to Jan Mayen and after a period without signals the walrus turned up in Nordland in Norway. Here the tag stopped after having transmitted for 157 days. The stock affiliation of the walrus will be investigated by genetics from a skin biopsy collected during the tagging. Both transmitters were subsequently discovered by locals on the beaches where the last signal was received, and delivered back to the Museum.

On 21 November 2013 four **sperm whales** entered the sound between Streymoy and Eysturoy, the two largest islands in the archipelago. The area where the whales were located was shallow and difficult for skilful ship handling, so rescue was not attempted. The second day one animal was brought with the currents under a bridge, where it hit a pile and was injured, before entering deeper waters, and finally leaving the next day. A second whale stranded and died the second day while one whale died the following day. The fourth animal made it out again to deeper waters in the sound. But it never left the area, and was found dead on 14 April 2014 (Appendix 3). Two animals were pulled to offshore waters by the Fishery Inspection, while one skeleton was preserved by the Museum.

On 23 Desember 2013 three **sperm whales** entered Hvalvík on Streymoy. Although the whales appeared close to land, almost stranded, two MOB boats from the Fishery Inspection managed to drive the three animals back to sea, and hereby avoiding a potential new stranding incident.

II.c Laboratory work

The biological material collected from **pilot whales** in 2013 has been prepared ready for finalizing age, diet and reproduction examinations.

When possible, the Environment Agency performs tissue sampling for contaminants analyses from two **pilot whale** drives a year, ideally from 25 individuals in each school. The samples are stored in the Environmental Specimen Bank at approx. -20°C from which they may be retrieved for analyses upon request, also from external scientists. From the total number of specimens sampled, selections of subsamples of individuals for chemical analyses are done with selection criteria on sex and age/size depending on the analyses aims in question. The samples taken and stored are primarily blubber and muscle and from a smaller selection of animals, mainly the older/larger ones, also kidney and liver. Muscle samples are analysed for mercury, and blubber samples for persistent organic pollutants such as PCB and "legacy" pesticides like DDT, and increasingly also emerging pollutants like PFOS (the latter though analysed in muscle and/or liver). Kidney and liver samples are analysed for mercury, cadmium and selenium. The focus of the monitoring of muscle and blubber is to elucidate possible changes in concentrations over time in the exposure of the human population utilizing pilot whale blubber and meat for food. The focus of the monitoring of heavy metals in kidney and liver tissues is to follow the possible risk to the pilot whale imposed by elevated tissue metal concentrations. Since 2008, the monitoring data established in the AMAP run by the Environment Agency, with support from the Ministry of Environment and Environmental Protection Agency DK, has been available online at www.us.fo, under the heading ENVOFAR. ENVOFAR is a cooperation of Faroese institutions that work actively to describe and study the environment in the AMAP and CAFF working groups under the Arctic Council (see also www.envofar.fo).

Samples of 20 **pilot whales** from the Faroe Islands were included as a reference material for species identification of stranded animals, distinguishing between the two morphologically very similar *G. melas* and *G. macrohynchus* by the use of mitochondrial and nuclear loci (microsatellites) genetic markers.

Skin samples from 25 **pilot whales** landed in the Faroe Islands were included in a study looking at sequence polymorphism and geographical variation at mitochondrial and MHC loci in long-finned pilot whale from the North Atlantic based on samples from five areas, Cape Cod (NE USA), Faroe Islands, United Kingdom, Norway

and Northwest Iberia (Monteiro *et al. Submitted*).

II.d Other studies

In the Faroe Islands **grey seals** are merely killed at salmon farms, when interfering with the installations. In 2010 a logbook system of seal culls was implemented and farmers were motivated to deliver statistics on an annual basis. Unfortunately, the reporting system is still not optimal in providing a full overview of grey seal removals.

II.e Research results

A study using genetic markers to identify species of **pilot whales**, distinguishing between the long-finned *G. melas* and the short-finned *G. macrorhynchus*, revealed positive identifications. The DNA study identified mixed ancestry for one individual, the maternal species being *G. melas*. This is the first hybridization documented between the two species, and the first post-F1hybrid genetically identified between cetaceans, revealing interspecific genetic introgression in marine mammals.

Sequence polymorphism and geographical variation at two adaptive loci in the Major Histocompatibility Complex (pathogen-driven selection) was investigated in long-finned **pilot whales** from three regions in East Atlantic and one region in West Atlantic. A spatial diversity in genetic substructure was identified, where Iberian pilot whales were found to represent a significantly genetically differentiated group. But a significant structure in genetic diversity across North Atlantic could not be demonstrated, which is contrary to studies using neutral markers.

A study on neurons and glial cells in **pilot whale** brain was successfully completed as an Master study in biology at the University of the Faroe Islands. The study has been described in a scientific paper submitted to Frontiers in Neuroanatomy.

III. ONGOING (CURRENT) RESEARCH

The Museum of Natural History will continue tracking **pilot whales** by satellite telemetry, in order to assess migration patterns and the distribution area of pilot whales recruiting to the Faroese harvest.

A PhD study at the Environment Agency on negative effects of pollutants on hormone and vitamin concentrations in **pilot whales** is in progress.

IV. CATCH DATA

Given in Appendix 1.

V. BY-CATCH DATA

The electronic logbook system for all fishing vessels larger than 15 GRT, reporting also marine mammal by-catch, has been in function for two years (some fleets). Reported by-catches are given in Appendix 2. The rare incidences with by-catches of large whales are usually reported directly to the Museum.

VI. ADVICE GIVEN AND MANAGEMENT MEASURES TAKEN

None

VII. PUBLICATIONS AND DOCUMENTS

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APPENDIX 1 – CATCH DATA

Pilot whale drives in the Faroe Islands, 2013.			
Date	Locality	Number of whales	Samples taken
21 July	Viðvík	125	34
30 July	Fuglafjørður	267	25+25
8 August	Sandavágur	107	20+24
11 August	Leynar	21	21
13 August	Húsavík	135	20
27 August	Hvalvík	51	51
6 September	Sandavágur	50	20
22 September	Hvalvík	120	20
10 October	Sandavágur	108	21+2
1 November	Hvannasund	86	18
14 November	Vestmanna	34	0
2013	**11 grinds**	**1.104 whales**	**321**

Catches of species other than *G. melas* in the Faroe Islands, 2013.				
Date	Locality	Species	Number	Samples
13 August	Hvalba	Lagenorhynchus acutus	430	0
2013			430	

APPENDIX 2 – BY-CATCH DATA

By-catch in the Faroe Islands, 2013.				
Date	Locality	Species	Number	Samples
?	Faroese EEZ	G. melas	5	0
?	Faroese EEZ	?	1	0
2013			6	

APPENDIX 3 - STRANDINGS

Strandings in the Faroe Islands, 2013.				
Date	Locality	Species	Number	Samples
21 Nov	Faroe Islands	Physeter macrocephalus	3	1
2013			3	1

4.2 GREENLAND
PROGRESS REPORT ON MARINE MAMMALS 2013

Compiled by The Greenland Institute of Natural Resources
Catch, by-catch and strandings statistics provided by the Ministry of Fisheries, Hunting and Agriculture

I. INTRODUCTION

This report summarizes the research on pinnipeds and cetaceans done in Greenland in 2013 by The Greenland Institute of Natural Resources (GINR), in collaboration with several organizations.

II RESEARCH 2013

A Species and stocks studied

Pinnipeds

- Walrus *Odobenus rosmarus* – Northern Baffin Bay & West Greenland /Southern Baffin Island
- Hooded seals *Cystophora cristata* –Western Atlantic
- Harbour seal *Phoca vitulina* – Central West and South Greenland
- Bearded seal *Erignathus barbatus* – Baffin Bay and South Greenland
- Ringed seal *Pusa hispida* - West and East Greenland
- Harp seal *Pagophilus groenlandicus* – West Greenland

Cetaceans

- Narwhal *Monodon monoceros* - West and East Greenland
- Harbour porpoise *Phocoena phocoena* – West Greenland
- Sperm whale *Physeter macrocephalus* – West and East Greenland
- Bowhead whale *Balaena mysticetus* –West Greenland
- Humpback whale *Megaptera novaeangliae* - West and East Greenland
- Fin whale *Balaenoptera physalus* – West and East Greenland
- Minke whale *Balaenoptera acutorostrata* – West and East Greenland

B Field work in 2012

Walrus

To correct for availability bias (i.e. animals not seen because they were submerged) in aerial surveys, and to better understand the connectivity between walrus harvested in Qaanaaq and other areas, Inuit hunters tagged 8 walruses with satellite transmitters at the ice edge in the North Water Polynia.

Seals

The harbour seal is classified as "Critically Endangered" in the Greenland Red List, and in 2010 all hunting of harbour seals was banned. Despite reports of sporadic observations, no stable colonies have been identified in recent years on the west coast north of Cape Farewell. Based on information from local hunters, a haul out site for harbor seals was identified south from Nuuk, in the municipality of Sermersooq in 2010, and information about a new one further south was obtained in 2012. Both places were monitored in 2013 and the presence of pups was confirmed for the southernmost site, suggesting that this location may seasonally contain a stable breeding colony.

Collection of stomach samples and other tissues from the seal harvest in the Icefjord near Ilulissat in Disko Bay started in 2012 and continued in 2013. The aims of the project are to identify the diet of seals in the area and to look into ecological interactions. Samples of fish are also collected and all the practical aspects of this project are run by locals.

In collaboration with the University of New York, and with oceanographic measurements as primary objective, 3 ringed seal were tagged with satellite transmitters in Sermilik Fjord, South of Tasiilaq in East Greenland and 4 were tagged in the Icefjord in Ilulissat, Disko Bay. The telemetry in Disko Bay may also help to produce advice regarding stock structure and management of ringed seals at a local level

Cetaceans

With the aim of mapping migration routes and understanding stock structure, GINR attempted to tag narwhals and belugas in Northwest Greenland (Qaanaaq) and narwhals in East Greenland (Scoresby Sund). This work was done with the help of local hunters.

To better understand their foraging behaviour, 4 narwhals from East Greenland were equipped with temperature sensitive stomach probes, coupled with acoustic tags and satellite transmitters.

Following a pilot study from 2012, with funding from the US Office of Naval Research, and with the aim of using sounds produced by narwhals to better understand the feeding ecology and vulnerability to anthropogenic impacts of this species, narwhals were recorded from leads in the pack ice in Baffin Bay during spring 2013. The recorders were made using a high frequency hydrophone array that should allow for estimating source levels in a full frequency spectrum.

During summer 2013 in Maniitsoq, 15 harbour porpoises were herded into nets by hunters working together with researchers. The porpoises were equipped with satellite transmitters attached to their dorsal fins.
In Tasiilaq, East Greenland, samples of the killer whale catch were collected for a study on contaminants led by the University of Aarhus.

As part of a comprehensive series of studies on the ecology, abundance and stock structure of bowhead whales, carried out by GINR in cooperation with other institutions, hunters from Qeqertarsuaq collected 65 biopsies from bowhead whales in Disko Bay between March and May. The samples are being used for sex determination, genetic identification and stock identity.

A project was launched in 2013, in cooperation with the US Fisheries and Wildlife Services, with the aim of developing equipment and techniques to deploy sound recorders on bowhead whales, to study the effect of anthropogenic noise on the behaviour of this species. In 2013, 4 bowhead whales were tagged with combined radio transmitters and acoustic recorders.

To obtain dive data for calibration of aerial surveys, hunters attached 3 satellite transmitters to minke whales in Maniitsoq during summer. This is a difficult task, for which methodology is under development.

As in previous years, the occurrence and site fidelity of humpback whales in Godhåbsfjorden (Nuuk) was investigated using photo-identification. Pictures of humpback whale flukes and dorsal fins were also provided by the public and tour operators in Nuuk and Disko Bay. In addition, 11 biopsies were obtained from humpback whales in Nuuk and one satellite tag was deployed.

As something unusual, two sperm whales spent several weeks in Godhåbsfjorden. Both individuals were photographically identified and biopsied, while satellite senders were attached to their backs and sound recordings were made.

In addition, data on background noise and eventual cetacean sounds were collected with moored hydrophones in Godhåbsfjorden. The expansion of activities near Nuuk was motivated by the need to gather baseline data before the establishment of a large scale iron mine.

A study of the ecology, movements and occurrence of large whales in East Greenland started in Tassilaq in 2013, with a pilot season aimed at recognising the place, establishing contacts, initiating photo identification of humpback whales and deploying moorings for Passive Acoustic Monitoring (see below).

Biological samples and empiric data on the weight of edible products from 3 humpback whales were obtained in cooperation with whale hunters in 2013. This was a task requested by the International Whaling Commission.

As part of the requirements for obtaining a whaling licence, hunters from West Greenland provided GINR with tissue samples from 106 minke whales, 9 fin whales and 5 humpback whales , while 4 minke whales were submitted from East Greenland.

As in previous years, the seasonal acoustic activity of large whales and bearded seals was monitored by an array of recorders moored to the seabed at several locations in the Davis Strait and Baffin Bay. The passive acoustic monitoring in Baffin ay and Davis Strait stopped in September 2013. Passive acoustic monitoring in East Greenland that started in 2012 continued in 2013, with the deployment of a recorder moored off Sermilik, Tasiilaq, in cooperation with the University of Washington and Woods Hole Oceanographic Institution.

The Danish Centre for Energy and Environment (DCE), University of Aarhus, maintains a database with observations collected by dedicated marine mammal and Bird Observers on board vessels carrying out seismic surveys under licences provided by the Bureau of Minerals and Petroleum.

C Laboratory work in 2013

Laboratory work carried out in 2013 included the analysis of stomach samples from seals and fish and in Nuuk, as well as genetic analyses of bowhead whales at the University of Oslo.

Subsamples of minke, fin and humpback whales from the Greenland tissue databank were processed and sent to laboratories in Sweden and Germany for analysis of stock structure.

Sound recordings from moorings in West and East Greenland are being analyzed for estimates of background noise and seasonal occurrence of cetaceans and bearded seals, as well as monitoring of seismic exploration.

D Other studies in 2013

A number of desktop studies were carried out during 2013, including analysis of catch statistics and assessments of walrus and harbour porpoise for scientific working groups under NAMMCO and of large whales for the IWC.

In 2013, Nynne Hjort Nielsen started a PhD study on the ecology of harbour porpoise in West Greenland.

In 2013, Outi Tervo obtained a grant for a postdoctoral position on bowhead whales, focusing primarily on acoustic behavior. The position started in 2014.

E Research results in 2012

Walrus

Results for the walrus studies can be seen in the report from the NAMMCO scientific working group on walrus from 2014

Seals

Analysis of the stomach samples and other data from the seal harvest is a work in progress.
Analysis of satellite telemetry data is also a work in progress, or has been published.

Cetaceans

The majority of research results from the fieldwork of 2013 are not available yet.

III ONGOING RESEARCH IN 2014

As in previous years, GINR focuses on identifying important areas for harbour seals in order to implement monitoring programs. The haulout site identified in 2012 in the municipality of Sermersooq was visited in 2013 and 2014. Tagging of ringed seals in the vicinity of Ilulissat (West Greenland) and Tasiilaq (East Greenland) for obtaining oceanographic data (temperature at depth) with the help of seals continued in 2014.
In order to understand the stock delineation and to obtain complementary data for abundance estimates, GINR runs a series of satellite telemetry studies on walrus, narwhals and belugas in West Greenland, as well as narwhals in East Greenland. Satellite telemetry of narwhals in East Greenland was complemented with the use of stomach temperature sensors to document feeding events and acoustic tags to develop techniques for assessing the impact of anthropogenic noise on cetaceans.

There was an aerial survey for walrus in the North Water Polynia during spring, with narwhal, beluga and bearded seal as secondary target species.

To better advice the Government of Greenland regarding the effect of oil exploration and other human activities in the narwhals of Melville Bay, 3 projects were carried out in 2014: an aerial survey during summer; deploying of moorings for passive acoustic monitoring of narwhals and seismic near selected glaciers and a social science study of local knowledge and perception on the effects of oil exploration in narwhals, based on interviews of hunters and analysis of catch data.

The long term studies of bowhead whales in Disko Bay for 2014 included biopsy taking for population studies and development of technology for combining satellite telemetry and recording sounds on the surface of whale bodies, in order to better understand the effect of sound from seismic air guns. In addition, oceanographic tags that record temperature, salinity, depth and position were tested. Furthermore, postdoctoral research focusing on the singing behavior of bowhead whales and the effects of anthropogenic noise was initiated. This also included fieldwork in the Beaufort Sea in Collaboration with Alaska Department of Fish and Game.

Collection of identification pictures of humpback whales flukes and dorsal fins from West Greenland continued throughout 2014. The work in Nuuk in 2014 included photo-identification and biopsy sampling

Studies of large whales in Tasiilaq, Southeast Greenland continued in 2014, and were expanded to include photo identification, biopsy darting, satellite telemetry and passive acoustic monitoring.

IV ADVICE GIVEN AND MANAGEMENT MEASURES TAKEN

Advice and quotas for cetaceans and pinnipeds in the calendar year 2013 are summarized in Table 1. Actual catches are given in Appendix 1.

According to legislation, animals that are struck but lost should be reported and will be taken from the quotas. However, the scarcity of reports suggests that there is underreporting of struck bust lost animals for beluga, narwhal and walrus. The two stocks of walrus in West Greenland are also hunted in Canada. In consequence, walrus quotas are lower than the recommended removals to allow for struck but lost animals and for harvest in Canada.

Table 1. Advice and quotas for cetaceans and pinnipeds in the calendar year 2013

Species	**Year advice given (year of survey used in assessment) (*year of last survey*)**	**Advisor**	**Advice**	**Quota 2013/ Management measure 2013**
Seals				
Harbour seal	2010 (2010) (*2014*)	NAMMCO	Total protection	Protected since 2010
Grey seal	2009 (2009)	NAMMCO	Total protection	Protected since 2010
Harp seal	2013 (2012)	ICES/NAFO	No concern	No catch limit
Hooded seal	2013 (2012)	ICES/NAFO	No concern	No catch limit
Walrus				
Walrus – Baffin Bay	2010 (2009)	NAMMCO	68 or less removals	Quota of 74
Walrus Davis Strait – Baffin Island	2010 (2008)	NAMMCO	89 or less removals	Quota of 61
Walrus East Greenland	2010 (2008)	NAMMCO	20 or less removals	Quota of 18
Beluga	2012 (2006) *(2012)*	JCNB (& NAMMCO)	310 or less removals	Quota of 310
West Greenland Narwhals				
Inglefield Bredning	2012 (2009) *(2014)*	JCNB (& NAMMCO)	85 or less removals	Quota of 85
Melville Bay	2012 (2007) *(2014)*	JCNB (& NAMMCO)	81	Quota of 81
Uummannaq	2012	JCNB (& NAMMCO)	85 or less removals	Quota of 85
Disko Bay area	2012 (2006) *(2012)*	JCNB (& NAMMCO)	59 or less removals	Quota of 59
East Greenland Narwhals				
Ittoqqortormiit	2012 (2008)	NAMMCO (& JCNB)	70 or less removals	Quota of 70
Tasiilaq	2012 (2008)	NAMMCO (& JCNB)	18 or less removals	Quota of 18
Large whales West Greenland				
Bowhead whale	2012 (2006) *(2013)*	IWC (Scientific committee only)	2 or less removals	Quota of 2
Humpback whale	2012 (2007)	IWC (Scientific committee only)	10 or less removals	Quota of 10
Fin whale	2012 (2007)	IWC (Scientific committee only)	19 or less removals	Quota of 19
Minke whale	2012 (2007)	IWC (Scientific committee only)	178 or less removals	Quota of 178
Large whales East Greenland				
Minke whale	2012	IWC (Scientific committee only)	12 or less removals	Quota of 12

With the exemption of Walrus in the Baffin Bay stock, all catch levels of cetaceans and pinnipeds in 2013 were in accordance with biological advice. A working group under the NAMMCO Scientific Committee assessed walruses of all Greenland stocks, using the catches from 2013 in the analysis. Following this assessment, an updated advice was provided by NAMMCO in 2014 and the quotas for 2014 were closer to the advice.

In 2013, NAMMCO recommended that that Greenland should take a closer look at the accuracy of catch data for harbor porpoises and killer whales. This work has not been completed.

In 2014, the CITES management authority of Greenland requested an updated Non Detriment Findings report (NDF) from its scientific authority. The NDF was not completed at the time of writing this national progress report.

During 2014, most quotas were according to biological advice, with exemption of narwhals in Melville Bay, where atypically open water in spring led to the quota being used before start of the summer hunting season. Quotas for large whales are normally set by the IWC. However, in 2012 there was no agreement about quota levels for Greenland for the period 2013-2018. In the absence of IWC quotas, the Government of Greenland sat catch levels based on the advice of the Scientific Committee of the IWC. The IWC has moved from yearly to biennial meetings, so Greenland quotas for 2014 were also self imposed. On its meeting in 2014, the IWC agreed upon quotas for the remaining years of the block period; 2015 – 2018.

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VI APPENDIX 1 - CATCH DATA

Catch data for hunting and fishing is collected and administrated by the Ministry of Fisheries, Hunting and Agriculture.

Since 1993, catches of the most common game species, including pinnipeds and small whales, are voluntarily reported on a form that hunters have to send to the government in order to renew their hunting permit. This form contains information about monthly catches from October to September the following year. Since 2013 it is possible, but not mandatory to submit the information online. The information is stored in the Pininarneq/LULI database. The database includes also information about the hunter's status as either full time hunter or leisure time hunter, personal information such as date of birth, address, social security number, etc. and information about the town or settlement where the hunter lives. This database is linked to a larger fisheries database (LULI). In 2014, catch statistics for full years from Piniarneq/Jagtsystemet are only available for 2012 and before.

Catches of quoted species (narwhal, beluga, walrus, polar bear and large whales) are reported also in separated and more detailed special forms, which are delivered to the local authorities shortly after a catch and used to keep control over the number of licenses issued and the day to day status of the quota for each particular region. The local authorities forward the special forms regularly to the Hunting Agency of the Ministry of Fisheries, Hunting and Agriculture. The forms are input manually into Excel databases and into LULI (the hunting/fisheries database). Updated copies of these databases to use in assessments and other research are provided on request and yearly to the Greenland Institute of Natural Resources, who also has VPN access to the database. The information in the databases include, for each catch, date and position, information about the hunting method and time to death and biological data such as age class, gender, size, reproductive state and stomach contents.

Catch statistics for 2013 are shown in Table 2 (cetaceans) and Table 3 (pinnipeds).

Table 2. Reported catches of cetaceans in Greenland in 2013

Species (latin name)	**Year or Season**	**Stock Area / Region or Management Area**	**Catch or Strikes incl. Losses**			**Quota**
			Male	**Female**	**Total incl. Unkn.**	
Balaenoptera acutorostrata / Minke whale #	2013	West GRL	37	127	175 (2 of unknown gender)	178
Balaenoptera acutorostrata / Minke whale	2013	East GRL	1	3	6	12
Balaenoptera physalus / Fin whale	2013	West GRL	3	5	9 (1 of unknown gender)	19
Megaptera novaeangliae / Humpback whale	2013	West GRL	4	3	8	10
Balaena mysticetus / Bowhead whale	2013	West GRL			0	2
Delphinapterus leucas / White whale	2013	West GRL			268	330
Delphinapterus leucas / White whale	2013	Qaanaaq			26	20*
Monodon monoceros / Narwhal	2013	West GRL			122	144
Monodon monoceros / Narwhal	2013	Inglefield Bredning			83	85*
Monodon monoceros / Narwhal	2013	Melville Bay			70	81
Monodon monoceros / Narwhal	2013	East GRL			65	88
Odobenus rosmarus / Walrus	2013	West GRL			47	3) 60
Odobenus rosmarus / Walrus	2013	Northwater			65	1) 2) 62
Odobenus rosmarus / Walrus	2013	East GRL			8	18
Globicephala melas / Long-finned pilot whale	2013	GRL			154	
Orcinus orca / Killer whale	2013	GRL			35	
Delphinidae / Dolphins nei	2013	GRL			89	
Phocoena phocoena / Harbour porpoise	2013	GRL			2293	
Globicephala melas / Long-finned pilot whale	2012	GRL			430	
Orcinus orca / Killer whale	2012	GRL			44	
Delphinidae / Dolphins nei	2012	GRL			180	
Phocoena phocoena / Harbour porpoise	2012	GRL			2385	
Globicephala melas / Long-finned pilot whale	2011	GRL			274	

Orcinus orca / Killer whale	2011	GRL			39	
Delphinidae / Dolphins nei	2011	GRL			237	
Phocoena phocoena / Harbour porpoise	2011	GRL			2828	

** technical quotas for 5 years: beluga 100, narwhal 485*

1) Kvoten var på 64, fratrækket overfangst på 12 dyr fra sidste kvoteår, i alt 52
2) Kvoten var på 64, efter politisk beslutning blev der givet ekstra kvote på 10 dyr, i alt 62 inkl. fratrækket fra sidste kvoteår

3) Kvoten var på 61, der skal fratrækkes overfangst på 1 dyr fra sidste kvoteår, i alt 60
 # 1 minke whale, male, 7.8 meter, wounded/sick was permitted euthanized in Aasiaat. Not included in catch data above, October 2013.

Table 3. Reported catches of pinnipeds in Greenland in 2011-2013 as requested by NAMMCO Scientific Secretary. Harbour seals have been totally protected since 2010. The allocation between East and West Greenland is geographical catches, rather than by stock.

Species (latin name)	**Year or Season**	**Stock Area**	**Catch (pups)**			**Catch (group 1+ or adults)**			**Catch Total**	**Quota if applicable**
			Male	**Female**	**Total incl. Unkn.**	**Male**	**Female**	**Total incl. Unkn.**	**incl. Struck & Loss**	
Phoca groenlandica / Harp seal	2011	West GRL							63,886	No quota
Phoca groenlandica / Harp seal	2011	East GRL							10,491	No quota
Phoca vitulina / Harbour seal	2011	West GRL							69	Banned hunting since 2010
Phoca vitulina / Harbour seal	2011	East GRL							10	Banned hunting since 2010
Phoca hispida / Ringed seal	2011	West GRL							53,487	No quota
Phoca hispida / Ringed seal	2011	East GRL							8,792	No quota
Erignathus barbatus / Bearded seal	2011	West GRL							990	No quota
Erignathus barbatus / Bearded seal	2011	East GRL							312	No quota
Cystophora cristata / Hooded seal	2011	West GRL							1,383	No quota
Cystophora cristata / Hooded seal	2011	East GRL							686	No quota

Phoca groenlandica / Harp seal	2012	West GRL							53,016	No quota
Phoca groenlandica / Harp seal	2012	East GRL							7,681	No quota
Phoca vitulina / Harbour seal	2012	West GRL							-	No quota
Phoca vitulina / Harbour seal	2012	East GRL							-	No quota
Phoca hispida / Ringed seal	2012	West GRL							51,912	No quota
Phoca hispida / Ringed seal	2012	East GRL							8,695	No quota
Erignathus barbatus / Bearded seal	2012	West GRL							879	No quota
Erignathus barbatus / Bearded seal	2012	East GRL							221	No quota
Cystophora cristata / Hooded seal	2012	West GRL							900	No quota
Cystophora cristata / Hooded seal	2012	East GRL							807	No quota
Phoca groenlandica / Harp seal	2013	West GRL							48,093	No quota
Phoca groenlandica / Harp seal	2013	East GRL							10,315	No quota
Phoca vitulina / Harbour seal	2013	West GRL							-	No quota
Phoca vitulina / Harbour seal	2013	East GRL							-	No quota

Phoca hispida / Ringed seal	2013	West GRL							35,180	No quota
Phoca hispida / Ringed seal	2013	East GRL							8747	No quota
Erignathus barbatus / Bearded seal	2013	West GRL							610	No quota
Erignathus barbatus / Bearded seal	2013	East GRL							186	No quota
Cystophora cristata / Hooded seal	2013	West GRL							657	No quota
Cystophora cristata / Hooded seal	2013	East GRL							561	No quota

Note: catch reporting still ongoing for 2012 and 2013

VII APPENDIX 2 - BY-CATCH DATA

In Greenland, trawling fisheries of shrimp and Greenland halibut operate with sorting grids, so by-catch of marine mammals are nonexistent. There is a new mackerel fishery, which has the potential of resulting in by-catch of marine mammals, however no marine mammal by-catch was reported from this fishery in 2013.

Seals and small cetaceans, particularly harbor porpoise could potentially entangle in coastal pond and gill nets. However, harvesting these animals with nets is not illegal and by-catch, if any, is probably used for subsistence and reported as catch. For pinnipeds the use of netting is legal and regulated by an executive order.

By far, the best known incidence of by-catch in Greenland relate to large whales, particularly humpback whales but also bowhead whales entangled in pond nets, gill nets and crab pot lines.

Reported by-catch of cetaceans is summarized in Table 4. There were no reports of by-catch of protected pinnipeds in 2013.

Data on by-catch is administered by the Ministry of Fisheries, Hunting and Agriculture.

VIII APPENDIX 3 - STRANDINGS

The combination of a very large coastline, sparse human population and steep, rocky shoreline with very few beaches makes it very difficult to monitor strandings in Greenland. Most reports consist of observations of floating carcasses, usually sperm whale but also sometimes bowhead whales. Data is kept by the Ministry of Fisheries, Hunting and Agriculture. Data for 2013 is shown in Table 5.

Table 4. Reported by-catch of cetaceans in 2013 in Greenland. There were no reports of by-catch of protected pinnipeds.

By-catch reporting for CETACEANS

Species (latin name)	Year or Season	Stock Area / Region or Management Area	By-Catch			Comments on circumstances if applicable		
			Male	Female	Total incl. Unkn.	Fishery type	Live - release	Other details
Bowhead whale	June 2013	Aasiaat, West GRL			1			1 bowhead whale near Aasiaat (no length given) observed entangled in fishing gear for crabs, June 2013. Not found again.
Humpback whale		Qeqertarsuaq, West GRL		1				1 humpback whale female near Qeqertarsuaq (10.64 meter) entangled in fishing gear for crabs was permitted euthanized, June 2013.

By-catch reporting for PINNIPEDS

Species (latin name)	Year or Season	Stock Area		By-Catch			Comments on circumstances if applicable		
				Male	Female	Total incl. Unkn.	Fishery type	Live - release	Other details
Not treated in the reporting-system as by-catch. Netting allowed in GRL.									

Table 5. Reported strandings of cetaceans in 2013 in Greenland. There were no reports of strandings of pinnipeds in 2013

Species	Year or Date	Stock Area / Region	Strandings				
			Male	Female	Total incl. Unkn.	Beach-cast	Other details
Sperm whale	June 2013	Kangeq-Nuuk, West GRL			1		No post mortem
Sperm whale	October 2013	Baffin Bay	1		1		Left in water. Immature male individual. No observation of well developed teeth in lower jaw. Protruding penis. No signs of ship strike or shark bites. 800 cm
Sperm whale	May 2013	Fyllas Banke	1		1		Left in water
Sperm whale	May 2013	Qeqertarsuaq, Sermersooq, West GRL			1		No post mortem
Sperm whale	May 2013	Attamik, West GRL			1		No post mortem

Strandings reporting for PINNIPEDS

Species (latin name)	Year or Season	Stock Area	Strandings			Comments on circumstances if applicable			
			Male	Female	Total incl. Unkn.	Fishery-related	Live	Beach-cast	Other details
No information received on strandings for 2013									

4.3 ICELAND
PROGRESS REPORT ON MARINE MAMMALS IN 2013

Compiled by Gísli A. Víkingsson, Þorvaldur Gunnlaugsson and Sverrir D. Halldórsson.
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I. INTRODUCTION

The following reports on studies on marine mammals in Icelandic and adjacent waters in 2013. While most of the studies were conducted by the Marine Research Institute (MRI) and it's various research partners, queries for information on research were sent to all offices or individuals known to have been involved in marine mammal research or data collection during the period. These include University of Iceland Research Center in Húsavik (UIRCH), Húsavík Whale Museum (HWM); Faxaflói Cetacean Research project (FCR), Innovation Centre, Iceland (ICI); Keldur, Institute for Experimental Pathology (KIEP); The Institute of Natural History (INH); University of Iceland (UI) as well as data collection from private commercial platforms such as whaling and whale watching companies. The Icelandic Seal Center (ISC) has conducted seal research in Iceland since the year of 2008. The Icelandic Institute of Freshwater Fisheries (IFF) has one joint employee with ISC, who is also head of Seal Research department at ISC. ISC is currently cooperating with several institutions regarding seal research, such as Vör Marine Research Center at Breiðafjörður, BioPol ehf a Marine Biotechnology Science Hotel in Skagaströnd, Hólar University Collage, The University of Stockholm, Natural history museum of Sweden and Swedish University of Agricultural Science.

As in previous years research efforts on marine mammals at the MRI in 2013 were largely devoted to a comprehensive biological programme from the commercial catch of fin whales initiated in autumn 2006 and catches taken since (2009, 2010 and 2013 seasons). Further analysis of the previous NASS sightings surveys (Gunnlaugsson et al. 2013; Pike et al. 2013) and planning for the survey in 2015. Sightings data on all species and effort is routinely collected on board the Hvalfjorður station whaling vessels, and stored in a database at the MRI.

The MRI preserves all genetic samples available. Since 2012 skin samples for genetic analysis have been routinely collected from most marine mammals by-caught in the MRI fisheries surveys.

The INH is responsible for collection and preservation of museum specimens of marine mammals in Iceland. The INH archives mammal skeletons and bone remains discovered from the natural environment and archaeological material from middens. The archive includes about 200 specimens, mostly from walruses. Information on occurrences of Walruses found in Iceland has been collected over many years, historical and recent. Cleaning and preservation of a blue whale skeleton from a stranding event in 2010 is completed.

Information on strandings of whales found in Icelandic waters has been collected by the MRI over many years. This includes dead whales, ice-locked live animals and live animals driven ashore, historical and recent. Biological investigations of strandings is conducted on an opportunistic basis. The ISC monitors visits of vagrant seals to the coast of Iceland by collecting information about such visits from the news or human resources (photos of life animals) or by receiving corpses of stranded dead pinnipeds.

In recent years increasing number of scientists have conducted research on marine mammals from platforms of opportunity such as those offered by the rapidly expanding commercial whale watching operations. The geographical scale of these studies is generally small, but the frequency of observation is high during the summer and some companies operate throughout the year. Studies on cetaceans conducted under the auspices of the University of Iceland have mainly focused on acoustics, photo-id, behaviour and distribution in near-shore areas.

II. RESEARCH 2013
a. Species/stocks studied

Pinnipeds

- Grey seal (*Halichoerus grypus*)
- Harbour seal (*Phoca vitulina*)
- Harp seal (*Pagophilus groenlandica*)
- Hooded seal (*Cystophora cristata*)

- Bearded seal (*Erignathus barbatus*)
- Walrus (*Odobenus rosmarus*)

Cetaceans

- Blue whale (*Balaenoptera musculus*)
- Fin whale (*Balaenoptera physalus*)
- Common minke whale (*Balaenoptera acutorostrata*)
- Humpback whale (*Megaptera novaeangliae*)
- Sperm whales (*Physeter macrocephalus*)
- Northern bottlenose whale (*Hyperoodon ampullatus*)
- Long-finned pilot whale (*Globicephala melas*)
- Killer whale (*Orcinus orca*)
- White-beaked dolphins (*Lagenorhyncus albirostris*)
- Harbour porpoise (*Phocoena phocoena*)

Pinnipeds

Harbour seals

Analyses of abundance and trends

The comprehensive seal count in Húnaflói bay is conducted annually at the end of July by the ISC (since 2007) the seventh year in a row. The count was carried out by several volunteers on 28th of July 2013 during 3 hours around low tide. All seals on the coastline of Vatnsnes and Heggstaðanes peninsulas in Húnaflói bay were counted (~100 km). The count resulted in 755 seals (mainly harbour seals), compared to 618 in the same area and time of year in 2012. In previous years, the numbers were considerably higher, with over 1000 animals counted (Granquist and Hauksson 2013). The number of seals in the area of Vatnsnes and Heggstaðanes will be monitored by repeating the count annually.

Interaction with salmon fishery

A study on the effect of seals on salmonids was initiated in 2009. The project is a cooperation between ISC and IFF. The main goal is to determine feeding habits of seals in river mouths in the north western part of Iceland, especially in regards of the effect of seals on salmonids. In 2009-2010 16 harbour seals were tagged with radio transmitters in order to monitor their presence in a river mouth during the summer. Seals were also regularly counted in the area during different times of the years (2009-2011). The diet of harbour seals that haul out in the river mouths Bjargaós and Sigríðastaðaós in Húnaþing vestra, NW-Iceland is also being investigated by IFF and the ISC. A special effort is put on studying the effect of seals on salmonids. Faecal samples from seals hauling out in the river moth area (collected between 2009 and 2011) were analysed with hardpart- and prey-DNA analysis during 2013. Prey-DNA analysis is a cooperation between ISC, IFF, Stockholm University and Natural history muséum in Stockholm. In addition, hair-samples from seals in the area were prepared for further stable-isotope analysis. To be able to compare the diet of seals hauling out in the river mouth area to seals from other areas, hair- and muscle samples from seals caught in nets in other parts of the country were obtained from BioPol during 2013and will be analysed for stable isotopes for comparison purposes. The stable isotope analysis is cooperation between ISC, IFF, BioPol and Stockholm University.

Other

The effect of seal watching on the behaviour and distribution of harbour seals has been studied by ISC and IFF since 2008. The main study site is Illugastaðir at Vatnsnes, NW Iceland. The results show that habour seals increase their vigilance in presence of tourists and more intense tourist behaviour has a greater effect on the seals. During periods when many tourists visit the area, harbour seals changed their distribution and moved further away from the seal watching sites (Granquist 2013). A book chapter was published in 2013 on interdisciplinary sustainable management of seal watching (Granquist and Nilsson 2013, see also Granquist and Sigurjónsdóttir 2014).

Age determination

Some of the seals collected by Biopol for food studies were aged in 2013, from GLGs' in canine teeth.

Grey seals

Analyses of abundance and trends

Grey seal pups were tagged with roto-tags in their back flippers during the pupping season in 2012 and 2013 by ISC on Strandir, NW_Iceland and Breiðafjörður, W-Iceland. In addition, pups were counted and aged according to the Canadian system, on appearance and growth. Tagged seals that are later re-captured, are recorded by the ISC.

Other pinniped species

Analyses of abundance and trends

ISC monitors visits of vagrant seals to the coast of Iceland by collecting information about such visits from the news or human resources (photos of life animals) or by receiving corpses of stranded dead pinnipeds. In 2013 the ISC did not receive any reports of vagrant seals in Iceland.

Cetaceans

Fin whales

The MRI conducted routine sampling (age, reproduction, genetics, diet, energetics) and measurements of every landed fin whale in the whaling station in Hvalfjörður (Gunnlaugsson *et al* 2013). In addition scientists from several other Icelandic and foreign research institutes performed sampling of the landed fin whales. Age reading of fin whales from the commercial hunt using laminated layers in ear plugs (MRI) and the aspartic acid racemisation method for eye lenses (MS project at the University of Copenhagen) was continued in 2013. The results of the different methods will be compared for estimating their reliability.

MRI scientists participated actively in the RMP *Implementation Review* process under the auspices of the Scientific Committee of the IWC.

Analyses of stock structure of North Atlantic fin whales continued (Benonisdóttir 2012; Elvarsson 2012; Víkingsson *et al* 2012; Gunnlaugsson *et al* 2012).

A collaborative project involving analysis of fin whale baleen plate measurements of nitrogen and carbon stable isotopes and trace elements, as a continuous-time recorder of seasonal migration, was initiated in collaboration with the University of Barcelona, Spain. Preliminary results will be presented in two separate communications (posters) to the next ECS.

Minke whales

Sampling and measurements of common minke whales conducted onboard the vessels were provided to the MRI by whalers. Attempts to tag common minke whales in the spring and autumn of 2013 were unsuccessful. One common minke whale was instrumented with a satellite tag 26th April 2013. No signals were received.

Studies on harmful effects of whale watching vessels on the behaviour and energetics of common minke whales in Faxaflói and Skjálfandi bays were continued (Martin, 2012, Christiansen et al. 2013a, 2013b, 2013c, 2013d).

MRI scientists participated in genetic collaborative work on stock structure issues relevant to management of minke whales (Benonísdóttir *et al* 2013, Tiedemann *et al* 2014a and b).

Studies continued at the MRI on the development of a new ageing method for common minke whales.

Blue whales

The blue whale project continued in 2013 with collection of photo-id material, behavioural data and acoustic tagging (AUSOMS mini)in Skjálfandi Bay by the MRI and IURCH. The Skjálfandi blue whale catalogue (photo-identification) sums 105+ individuals by the end of 2013. One blue whale was instrumented with a satellite tag on 12th July 2013. Position data were received until 12th August.

Humpback whales

Two humpback whales were tagged with satellite transmitter tags in October. Data were received from one of these during for one month (15/10-16/11 2013).

Collection of Photo-id material continued in Skjálfandi Bay in 2013 by the MRI, FCR and IURCH.

North of Iceland skin biopsies were collected by the MRI from 13 humpback whales in satellite tracking cruises in 2013. These samples are used in studies on population structure and to determine the gender of the tracked animals. One biopsy was obtained from a northern bottlenose whale.

Peducle scarrings and a first assessment on entaglement rate was estimated in humpback whales of Faxaflói and Skjálfandi Bays (Bertulli *et al.* 2011) is continuing.

Killer whales

Data collection continued for MRI's research project on killer whale ecology and behaviour in Breiðafjörður Bay Work (late winter) and around the Vestmannaeyjar Islands (summer). This project will be finalized in 2015.

Harbour porpoise

Collaboration with the University of Potsdam is ongoing to make use the existing 1300 harbour porpoise samples from Iceland (1991 onwards) and future samples in a wide genetic study (Lah *et al*. 2014). In 2013 additional 98 older harbour porpoise samples were prepared, 50 samples collected by lumpsucker fishermen and 53 obtained in the annual spring gillnet survey.

Sightings data

Preparations for the NASS survey scheduled in 2015 were continued at the MRI is cooperation with other participating nations.

Monitoring of sightings during whale watching operations was conducted in two bays, Faxaflói and Skjálfandi. Sighting and effort data is stored at each whale watching company and data from Skjálfandi is also stored and analysed at the HWM.

The data collection in Faxaflói available includes weather parameters, effort, sighting, group size, photo-ID images, and behaviour. Data analysis by the FRC aims to assess feeding behaviour, association with avian species, site fidelity, distribution (Bertulli 2013), occurrence of cutaneous disorders and epizoa (Bertulli 2010; Bertulli et al. 2012). Additionally, survival rates and abundance was assessed in both common minke whales and white-beaked dolphins, social structure (Bertulli et al. 2013 poster), vertebral malformations and colour pattersn (Bertulli et al. 2013 conference) were inverstigated in white-beaked dolphins (unpublished data).

A project to study the effects of the whale watching boats on the distribution and behaviour of whales was continued at the IURCH. This project is a part of the "Wild North project" which also includes a study on the potential disturbance of tourism on seal haul out behaviour (see above) (http://www.thewildnorth.org/).

III. ONGOING (CURRENT) RESEARCH

Pinnipeds

The ISC conducted an aerial harbour seal counting survey in August-September 2014, and data analysis is carried out at the moment. The biggest haul-out sites were counted, using airplane. In addition, an experiment was carried out, where a DRONE was used to count in some areas. This is the first time that harbour seal counting using a DRONE has been carried out in Iceland and an evaluation of the method is currently ongoing. Due to lack of financial support, the data provided by this year´s survey will not produce a significant population estimate for the Icelandic harbour seal popualtion and ISC will apply for funding for a population estimate survey in 2015.

A project where the diet of harbour seals that haul-out in river mouths in the north west of Iceland, with special efforts put on investigating the effect of seals on salmonids, initiated in 2009 by ISC and IFF will be continuing in 2014 and 2015. Feeding analyses built on stable isotopes, hard-part analysis and prey-DNA will be published and telemetry data from radio-tagged seals in the river mouth area of Bjargós/Sigriðastaðarós at Vatnesnes peninsula will be analysed.

A study on the effect of tourism on the spatial and behavioural haul-out patterns of harbour seal initiated in 2008 by ISC will also continue the following years (Granquist and Sigurjónsdóttir 2014). Codes of conducts for visitors and tour operators in the area regarding how to behave during seal watching was published in 2014 on behalf of The Wild North (www.twn.org). The effect of boat-based seal watching is being investigated. A BS thesis reviewing codes of conducts for seal watching worldwide was finished in 2014 and one master student is currently investigating the behaviour of tourists during seal watching.

An investigation on the timing of birth among harbour seals in the north western part of Iceland is conducted at the moment at the ISC. In addition, data of abundance and haul-out patterns of harbour seals at Vatnsnes peninsula is being analysed at the ISC and will soon be published.

Cetaceans
In 2012 the MRI submitted a comprehensive research program (Vikingsson *et al*. 2013) on fin whale stock structure as a part of the RMP implementation review process within the IWC. As the implementation review could not be completed in 2013 or 2014, discussion of the program was postponed.

Analysis of fin whale baleen plate measurements of nitrogen and carbon stable isotopes and trace elements, as a continuous-time recorder of seasonal migration, will be presented in two separate communications (posters) to the next ECS.
In 2014 behavioural and acoustic tags were placed on on humpback whales in collaboration with Dr. Tomonari Akamatsu from Japan and Maria Iversen from Denmark. Sound recordings of humpback whales were made using a single hydrophone by Master student Arnar Björnsson.
On-going photo-identification project of blue whales with Maria Iversen in charge.

IV. ADVICE GIVEN AND MANAGEMENT MEASURES TAKEN

Pinnipeds
No new population size estimate exists for the Icelandic harbour seal population, since the last estimate was made in 2011. Advice given for harbour seal in 2011 was in accordance with advice given in recent years. Based on the most recent surveys of harbour seals from August 2003 and 2006 respectively the SCI and MRI concluded that due to uncertainties in the number of net entangled animals it is not possible to predict whether the observed decline in abundance in the past will continue. Further, no figures for hunted seals exist for 2013. The MRI and ISC therefore reiterated the importance of better recording for both hunting and by-catch and that the stock was monitored with aerial surveys at two or three year intervals in the next years. Management objectives for the stock of harbour seals in Iceland were set by Icelandic authorities in 2010.

Advice given for grey seal in 2012 was in accordance with advice given in recent years. No new population estimate exists for the Icelandic grey seal population. The grey seal population probably has decreased considerably from the population size in 2008/9 and even more from the year 1990 when the population size was estimated about 12000 animals. The survey method was improved in year 2005 by counting pups in every major breeding site more often than once and take into considerations the stage of the pups. However it is clear that the exploitation of the population has been non-sustainable the last decades of the 19th century. The catch has probably nevertheless declined considerably in the recent years. The population size in year 2012 was the lowest since year 2004, although the changes since the turn of the new century probably were not significant statistically. It was not clear what factors could explain this reduction in the population, however by-catch probably plays a part in this and it is considered important to improve the recording process of the by-catch, as well as grey seal hunting.

Management objectives for the stock of grey seal in Iceland were set by Icelandic authorities in 2005.
The management objective set for the grey seal stock in 2005 calls for action if the stock is further reduced below the estimated level in 2004 of 4100 animals. The stock was probably close to the management objective in year 2012, so the MRI and the ISC stressed the importance of more regular monitoring. An aerial survey of grey seal pups is planned for the autumn of 2015, if funds will be available.

Cetaceans
Based on assessments conducted by the Scientific Committees of NAMMCO and the IWC, the MRI recommended that annual catches in 2013-2014 do not exceed 154 fin whales on the traditional whaling grounds west of Iceland (West Iceland Small Area). On the same basis the MRI recommended maximum annual takes of 229 common minke whales in the Icelandic continental shelf (CIC) area, and 121 animals in the CM area (Jan Mayen) in 2013 and 2014.

V. Publications and documents (2013)

Peer reviewed

Bertulli, C.G., Rasmussen, M.H. and Tetley, M.J. 2013. Photo-identification rate and wide-scale movement of common minke whales (*Balaenoptera acutorostrata*) in the coastal waters of Faxaflói and Skjálfandi Bays, Iceland. *J. Cetacean. Res. Manage* 13, 39-45

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Auðunsson, G.A. Vikingsson, G.A. 2013. Concentrations of POP's in minke whales from Icelandic waters. Paper SC/F13/SP22 presented to the IWC SP Expert Panel, Reykjavik. 22pp

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Elvarsson, B.T., 2013. An implementation of the statistical framework Gadget for common minke whales in Icelandic waters. Status update on multispecies modelling effort. Paper SC/F13/SP7 presented to the IWC SP Expert Panel. Reykjavík. 12pp

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Halldórsson, S.D. and Guðnason, K. 2013. A short note on radioactivity in minke whale meat (*Balaenoptera acutorostrata*) from Icelandic waters. Paper SC/F13/SP30 presented to the IWC SP Expert Panel, Reykjavik. 3pp

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VI APPENDIX 1 - CATCH DATA

Table 1. Commercial cetacean catch in coastal Icelandic waters in the 2013 summer season. The largest fin whales, female and male on record caught at the station were caught in 2013. The female (75ft) was identified as a blue whale hybrid, the male (70ft) is inconclusive. One female (69ft) had polycystic ovaries.

Species	Area	Male	Female	Unspecified	Total	Foetuses
Fin whale	West Iceland	58	71	5	134	19
Minke whale	Coastal Iceland	13	22		35	16

Table 2. Direct catches of pinnipeds in Icelandic waters in 2013. Where pups are known they are given separately and not included. Pups are generally caught in sealing nets and older seals shot.

Species	Area	Unspecified	Pups	Total
Harbour seal	Coastal Iceland	151	100	251
Grey seal	Coastal Iceland	116	88	204
Unspecified seal	Coastal Iceland	177		177

As in recent years, Icelandic authorities issued permits to Norwegian sealers to take harp seals within the Icelandic EEZ in 2013. These catches are not included here, but appear in the Norwegian sealing statistics.

VII APPENDIX 2 - By-CATCH DATA

In 2013, information on marine mammal by-catch (Tables 3 and 4, below) was obtained from all research surveys, inspectors in the Fishery Directorate's observer programme and handwritten logbooks kept by most of the commercial lumpsucker fishery. Finally, information on by-catch events are received on occasional basis from anecdotal sources, skin trading reports and lists of samples collected by various research groups. Electronic log-book records kept by the rest of the fleet have not been received by the MRI. Total by-catch estimates for 2013 are given in a report to the 21st Scientific Committee meeting (SC/21/11). Monitoring bycatch of pinnipeds is now the responsibility of the ISC where preparations have been made to improve the reporting. Inspectors have now been instructed to report all observed bycatch separately and check the reporting of the catchers.

In 2013, lumpsucker net fishing was rather less than in previous years and 57 boats reported some bycatch and inspectors were onboard in 57 trips. The reporting level was higher than in 2012 Gillnet effort was 1/3 the 1992 to 2005 level and the lowest on record. Inspectors were on only 3 trips.

VIII APPENDIX 3 – STRANDINGS

Information on stranded cetaceans in Iceland is compiled by the MRI in cooperation with the INH and other relevant institutions (Table 5, below). According to an arrangement formally adopted in 2005 the Marine Research Institute is the central authority concerning science and research while other aspects of strandings e.g. euthanasia/rescue, disposal of carcasses and preservation of museum specimens fall under the responsibilities of the Chief Veterinary Office, the Environment Agency of Iceland and INH respectively.

Depending on the condition of the stranded animals and accessibility, samples are taken for studies on diet (stomach), life history (teeth, ear plugs, gonads), genetics (skin, muscle), energetics (muscle, blubber) and for morbillivirus antigen screening (blood). Various tissue samples for pollution studies have been routinely collected during dissections of stranded or by-caught cetaceans in recent years. These are stored frozen at the MRI. Samples for genetic studies are obtained from most animals.

Table 3. Reported pinniped by-catch in 2013. 3 harbour and 6 grey seals reported by inspectors are also given under log books. Where pups are known they are given separately.

Species	Area	Count	Pups	Gear	Source
Harbour seal	Coastal Iceland	42		Gillnet	MRI survey
Harp seal	Coastal Iceland	6		Gillnet	MRI survey
Ringed seal	Coastal Iceland	1		Trawl	MRI survey
Harbour seal	Coastal Iceland	8		Lumpsucker net	Inspector
Grey seal	Coastal Iceland	47		Lumpsucker net	Inspector
Ringed seal	Coastal Iceland	1		Lumpsucker net	Inspector
Harbour seal	Coastal Iceland	27	2	Lumpsucker net	Log books
Grey seal	Coastal Iceland	10	3	Lumpsucker net	Log books
Ringed seal	Coastal Iceland	1		Lumpsucker net	Log books
Bearded seal	Coastal Iceland	1		Lumpsucker net	Log books
Unspecified seal	Coastal Iceland	77		Lumpsucker net	Log books

Table 4. Reported by-catch of cetaceans by the Icelandic fishing fleet in 2013.

Harbour porpoise	Coastal Iceland	69	Gillnet	MRI survey
White-beaked dolphin	Coastal Iceland	2	Gillnet	MRI survey
White-beaked dolphin	Coastal Iceland	2	Gillnet	Inspectors
Harbour porpoise	Coastal Iceland	2*	Lumpsucker net	Inspectors
Harbour porpoise	Coastal Iceland	1*	Lumpsucker net	MRI scientist
Harbour porpoise	Coastal Iceland	87	Lumpsucker net	Log books
Unspecified dolphin	Coastal Iceland	1	Lumpsucker net	Log books

* also reported in log books

Table 5. Cetacean strandings in 2013.

Species	Stranding events	Stranded animals
Minke Whale	2	2
Fin whale	1	1
Sperm whale	3	3
Killer whale	3	7
Harbour porpoise	2	2
Pilot whale	7	60
White-beaked dolphin	4	4
Total	22	79

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4.4 NORWAY
PROGRESS REPORT ON MARINE MAMMALS 2013

Compiled by Nils Øien & Tore Haug

I INTRODUCTION

This report summarises Norwegian research on pinnipeds and cetaceans conducted in 2013. The research presented here was conducted at, or by representatives and associated groups of,

The Institute of Marine Research (IMR);
The University of Tromsø – The Arctic University of Norway/ Department of Arctic and Marine Biology (UIT-AMB);
Norges Arktiske Universitet, Forskningsgruppe for arktisk infeksjonsbiologi (AIB);
The Norwegian Polar Institute (NP);
National Institute of Nutrition and Seafood Research (NIFES);
University of Oslo/Natural History Museum (NHM).

II RESEARCH BY SPECIES 2013

PINNIPEDS

Harp seals *Phoca groenlandica*
In the period 18 March to 1 April 2012 IMR conducted aerial surveys in the Greenland Sea pack-ice (the West Ice), to assess the pup production of the Greenland Sea populations of **harp** and **hooded seals**. Two fixed-wing aircrafts, stationed at Constable Pynt (East-Greenland) and Akureyri (Iceland), were used for reconnaissance flights and photographic surveys along transects over the whelping areas. A helicopter, operated from the applied expedition vessel (M/V"Nordsyssel") also flew reconnaissance flights, and was subsequently used for monitoring the distribution of seal patches and age-staging of the pups. On 28 March, a total of 27 photo transects, spacing 3 nautical miles, were flown using both aircrafts in the area between 70º43'N / 18º 31' - 18º 15' W and 72º 01'N / 17º 29' - 17º 29 W. All transects were flown with cameras operating to ensure about 80-90 % coverage of the area along each transect line, resulting in a total of 2792 photos shot. The survey resulted in a total pup production estimate for harp seals of 89 590 (SE = 12 310, CV = 13.7%), which is lower than estimates obtained in similar surveys in 2002 and 2007. (IMR)

Studies of **hooded seals** and **harp seals** from the Greenland Sea stock were conducted during a research cruise with R/V "Helmer Hanssen" to the Greenland Sea between 15 March and 2 April 2013. Seven adult female and 11 newborn hooded seals were culled for various scientific purposes: collection of brain tissue samples for continued studies of mechanisms underlying neuronal tolerance to lack of oxygen (hypoxia) (collaboration with Dr. T. Burmester, Zoologisches Institut und Museum, Universität Hamburg, Germany); anatomical studies of sensory organs and functions (collaboration with Dr. Martin Witt, University of Rostock, Germany); anatomical studies of tracheae for understanding of respiratory physiology in relation to diving in pinnipeds (collaboration with Dr. Andreas Fahlman, Texas A & M University, USA). In addition, samples and data were collected for other scientific projects at other Norwegian institutes that report separately. (UIT-AMB)

Hooded seals *Cystophora cristata*
During the aerial surveys conducted in the Greenland Sea pack-ice in 2012 data were also collected from hooded seal patches. The total estimate of hooded seal pup production was 13 655 (SE = 1 900, CV = 13.9%), which is lower than estimates obtained from comparable surveys in 2005 and 2007. (IMR)

To assess possible reasons for the apparent difficulties faced by the population of Greenland Sea **hooded seals** is a challenge. Based on new Norwegian reproductive samples collected in moulting patches off Northeast Greenland in July 2008 and July 2010, mean age at maturity was estimated at 3.7 (CI=0.4) years, which is considerably lower than the previous estimate of 4.6 years based on Russian moulting patch samples for the period 1990-94 used in previous models. In contrast, proportion based estimates of mean age at primiparity (MAP(P)) were similar for the 2008-10 and the 1991-94 data sets (5.5 years and 5.8 years, respectively) and a

common MAP(P) of 5.7 years could be fitted. There were also no indications of consistent trends in frequency based estimates of mean age at primiparity based on both moulting and breeding patch data collected over the period 1958-2010. Ovary based pregnancy rates were calculated for a total of 699 hooded seal females collected in Greenland Sea breeding patches over the periods 1958-62, 1978-80, 1982-85, 1987 and 1999. Estimates ranged from 0.62 to 0.74 over the study period and comparisons of 95% confidence intervals did not suggest any significant differences between sampling periods. The pregnancy rate for the total sample was estimated at 0.68 (95% CI=0.06). This is 20% lower than the pregnancy rate earlier estimated for Russian samples from 1986-1990 – these were, however, based on a more unreliable method. (IMR)

Four weanling **hooded seals** were live-captured and brought to the animal research facilities at Department of Arctic and Marine Biology (AMB) for studies of mechanisms underlying enhanced brain hypoxia tolerance and of metabolic responses during the post-weaning fast in this species. The described field research was combined with teaching of 20 students that participated on the cruise, which represents a mandatory part of the course "Arctic Biology" (BIO-2310) at the University of Tromsø-The Arctic University of Norway. (UIT-AMB)

Electrophysiological and biochemical studies of *in vitro* neuronal responses to hypoxic insult have been continued using fresh brain tissue from **hooded seals**, as part of ongoing collaborative studies (with Dr. T. Burmester, University of Hamburg, Germany) on the tolerance to hypoxia and to reactive oxygen species in the brain of diving mammals. (UIT-AMB)

Studies of chemical and histological changes in the liver of **hooded seal** pups during their initial nursing growth and the following post-weaning fast have been conducted to assess the metabolic functions of this organ in early life. (UIT-AMB)

Studies of body water homeostasis have been conducted in captive **hooded seals**. Pelagic hooded seals do not have access to freshwater. Experimental studies on harp seals suggest that seawater consumption may aid in maintaining water homeostasis and assist in the excretion of urea when more protein is used for metabolic energy in phase 1 of fasting. In order to determine the rate of seawater consumption in subadult hooded seals, five animals were injected with tritiated water early in a 5 day fasting period. Total body water, as well as total turnover rate of body water, was calculated in order to estimate the amount of metabolic water and exogenic water entering the total body water pool. Preliminary results suggest that also hooded seals supply their water budget by drinking seawater. (UIT-AMB)

Post mortem bronchoalveolar lavage and sampling of oesophagus and spleen of 4 hooded seals sacrificed due to other research purposes at the animal research facilities at Department of Arctic and Marine Biology. (AIB)

Brucella pinnipedialis: Cultured adherent cells from the epithelial lining of the esophagus in hooded seals are by immunocytochemistry found to be positive for the epithelial marker pan-cytokeratin after one week of culture and based on these characteristics they were verified to be epithelial cells. (AIB)

In vitro infection of primary hooded seal epithelial cells with *B. pinnipedialis* reference strain and two hooded seal isolates has been performed. The ability of the marine *Brucella* spp to enter and multiply intracellulary in hooded seal epithelial cells is evaluated by the use of a gentamicin protection assay. By killing the extracellular bacteria with gentamicin prior to harvesting the cells we are able to determine the number of surviving intracellular *brucellae* at fixed time points by plating serial dilutions of the cell lysate.(AIB)

The zoonotic aspect of *B. pinnipedialis* hooded seal strain was evaluated by *in vitro* infection of a human macrophage-like cell line and a human epithelial cell line as described above. By using a cholesterol-scavenging lipid inhibitor, entrance of *B. pinnipedialis* hooded seal strain in human macrophages by involvement of lipid-rafts was evaluated. Intracellular trafficking to lysosomal compartments was evaluated by confocal and electron microscopy. (AIB)

In vitro infection of primary cod macrophages with *B. pinnipedialis* from hooded seal are introduced to the *Brucella*-infection assays. This due to the fact that the hooded seal may not be a reservoir species but rather a spillover host, suggesting that these *Brucella* strains exists in a niche in the environment.(AIB)

We established an ELISA (assay test) for the detection of anti-*Brucella* antibodies in hooded seal, minke whale, fin whale, sei whale and polar bear compared its agreement to other serological tests. We also evaluated the different species ability to bind to Protein A/G, Protein A and Protein G. (AIB)

We utilized the ELISA method to investigate hooded seals for anti-*Brucella* antibodies. Some of the animals were also investigated with bacteriology.(AIB)

We infected BALB/c mice with a *B. pinnipedialis* hooded seal strain and assessed its pathogenic potential in the mouse model and compared the immunological response and the infection kinetics of *B. pinnipedialis* with that of *Brucella suis* 1330. Additionally we evaluated whether infection with *Brucella* spp. and concurrent exposure to PCB 153 in the diet lead to an altered immunological response and outcome of infection in the mouse model.(AIB)

The *in vitro* assays showed that tree different *B. pinnipedialis* strains were able to enter primary **hooded seal** epithelial cells *in vitro*. The *Brucella* spp. entered in low numbers, none of the strains multiplied intracellulary and all were nearly eliminated by 48 h p.i. These results suggest that the *B. pinnipedialis* is not able to multiply and induce a chronic infection in hooded seal epithelial cells. (AIB)

B. pinnipedialis hooded seal strain can enter human macrophages, as well as human epithelial cells. Intracellular entry of *B. pinnipedialis* hooded seal strain involves, but seems not to be limited to, lipid-rafts in human macrophages. Confocal microscopy revealed that intracellular *B. pinnipedialis* hooded seal strain colocalized with lysosomal compartments at 1.5 and 24 hours after infection. *Brucella pinnipedialis* hooded seal strain does not multiply or survive for prolonged periods intracellularly, suggesting a low zoonotic potential. (AIB)

Preliminary results from the infection assays in cod macrophages suggest that *B. pinnipedialis* hooded seal strain survives for prolonged periods intracellularly compared to mammalian cell lines. (AIB)

The ELISA results were consistent with other serological tests. The antibodies from hooded seals and polar bears reacted stronger to Protein A than to Protein G, whereas the sei whale, fin whale antibodies reacted stronger to Protein G than to Protein A. The minke whale antibodies reacted to Protein A and Protein G in a similar way. There was a strong correlation between the optical density results obtained with the ELISA with Protein A/G and Protein A or Protein G, showing that Protein A/G is as well suited as Protein A or G for the detection of anti-*Brucella* antibodies in these species by ELISA. The seroprevalences found with the ELISA for the different species were; **hooded seals** 23.8 % (n = 41/172), **minke whales** 12.2 % (n = 23/189), **fin whales** 5.3 % (n = 4/76), **sei whales** 12.5 % (n = 4/32), polar bear 13.5 % (n = 31/230).(AIB)

A closer investigation of serum samples from hooded seals in the Northeast Atlantic Stock revealed that pups had a lower probability of being seropositive than adults (3 % versus 25 %). The main reason for the increase in seroprevalence from pups to adults was a marked increase in probability of being seropositive for yearlings (35 %). The mean probability of being seropositive decreased with age for hooded seals > one year, and all seropositives were 1 – 5 years old. No relation was observed between *Brucella*-serostatus and body condition or reproductive traits. *Brucella pinnipedialis* was isolated from organs of one of 21 hooded seals; a seropositive yearling. (AIB)

In the mouse model we identified for *B. pinnipedialis* hooded seal strain a reduced pathogenicity as compared to positive control strain *B. suis* 1330. We were unable to detect any effect of exposure to PCB 153 on the immunological response to, or the outcome of infection with, *B. suis* 1330 or *B. pinnipedialis* hooded seal strain. (AIB)

Harbour seals *Phoca vitulina*

Harbour seals were counted along Norwegian coast during moult (August) in 1996-1999 and 2003-2006. Almost all known moulting areas along the coast were covered by aerial photo surveys during low tide (± 2 hours). In some sub-areas, two or three independent surveys were conducted. Additionally, visual counts from small boats and islands were carried out in some selected areas. The surveys revealed a total minimum population of about 7500 and 6700 harbour seals in 1996-1999 and 2004-2006, respectively. The results

suggested an annual reduction by 1-2% between the two periods. In some areas the numbers have been reduced by about 50%. Increased anthropogenic removals, and the phocine distemper virus (PDV) epidemic in the Skagerrak region in 2002, might both have contributed to the observed population decline. In 2010-2013, new aerial photographic and boat based surveys aimed to count harbour seals were carried out along the entire Norwegian coast where harbour seals are distributed. The surveys resulted in a total minimum number of 7080 harbour seals along the mainland Norwegian coast, which was a small increase since 2004-2006. In the Østfold county, annual counting during the last years revealed a population of 250-300 seals. In the area including the counties Vestfold, Telemark and Aust-Agder only c. 50 harbour seals were observed in 2010. At the west coast, including the counties Rogaland, Sogn and Fjordane, Møre and Romsdal, approximately 500, 550 and 700 harbour seals were counted, respectively. In Sør-Trøndelag county 632 harbour seals were observed, which was a significant reduction since 2003-2006 when 1527 seals were counted. Also in Nord-Trøndelag a significant reduction was observed, from 138 in 2003-2006 to 61seals in 2012. In the Nordland county, the results in both periods were identical, 2465 seals were observed. In the Troms county, an increase from 727 harbour seals in 2003-2006 to 986 in 2012-2013 were observed. In the Finnmark county, a total of 981 harbour seals were counted, which includes areas in western part of Finnmark that was not counted until 2010. (IMR)

The EPIGRAPH project (2008-2011) has collected data for the comparative study of the ecosystem of two major fjords in Norway: the Porsangerfjord and Hardangerfjord. The project has had a wide focus on all levels of the ecosystem, including, in Porsangerfjord, a study on the ecological role of the top predator thought to be most influential in the area: the **harbour seal**. Between 2009 and 2013, 15 harbour seals were equipped with GPS phone tags and data on their movement and diving behaviour collected and analysed. Otolith analysis of a limited number of scat samples indicated that the species' diet in the area was composed mainly of Gadidae and Cottidae, with a smaller fraction of pelagic fish such as herring. Results from the analysis of individual movements have shown that the habitat used by this resident population is limited to a relatively restricted area, the inner part of the fjord, with occasional trips to the outer areas occurring mainly during the autumn. In order to understand the foraging behaviour of this population, comparison of the temporal and spatial patterns of foraging with the distribution of different types of potential prey in the fjord will be done. However, methodological issues needed to be addressed first. Indexes based on both horizontal and vertical movements are available in the literature for inferring foraging behaviour in free ranging diving animals. For the horizontal movements, increases in path tortuosity and residence in given areas have been related to increases in profitability and therefore to the onset of foraging. However, the analysis of the temporal patterns of dives and dive characteristics has shown that in this species a relevant proportion of time is spent resting, not only at haul out sites, but also at sea, by floating at the surface or during low-activity diving. These behaviours have been found to generate a confounding effect in the analysis of horizontal movement, by positively biasing the times of residence in certain areas. For the vertical dimension, longer times spent at the bottom of the dives are thought to be related to the presence of prey. This study, however, has shown that for this coastal species several factors can affect this measure and therefore its interpretation. In particular, the type of resource targeted and therefore the predatory tactic used (pelagic vs benthic foraging) have been found to generate variation in the times spent at the bottom of dives, suggesting that ecological factors need to be taken into account when inferring foraging from movement and diving patterns. (IMR, UIT)

The haul-out behaviour of **harbour seals** was investigated during the moulting period in three different localities in Finnmark, North Norway, by performing repeated land based visual counts at haul-out sites. The results from the counts were modelled using generalized additive mixed modeling to gain a better understanding of the relationship between the fine scale haul-out behaviour of harbour seals and the tidal cycle, as well as other sources of variability affecting the number of seals hauled out. In addition, results from aerial survey photographs of harbour seals from the same areas were compared to the results from the land based counts. The development of hauled out seals in time at haul-out sites was explained by the tidal cycle and other sources of variation on haul-out behaviour such as disturbance, time of day and movement of seals between haul-out sites were factors influencing seal numbers. The within-day variation in seal numbers along the tidal cycle was also investigated through the use of correction factors which revealed that counting-surveys should be performed around low tide when corrected estimates have a small uncertainty. The unexpected between-days variation in seal numbers, together with the investigated quality of aerial surveys, revealed the need for replicate counts at haul-out sites to provide a measure of uncertainty in the population estimates of Norwegian harbour seals.

Other species

Previously collected satellite tracking data from **harp seals, hooded seals, crabeater seals, Ross seals** and **leopard seals** have been reviewed, to put the introduction of this technology and its importance for the management of seal populations into perspective. (Blix et al. 2013a) (UIT-AMB)

Research vessels, coastguard vessels and other providers have collected incidental observations of marine mammals. Recorded data include date, position, species and numbers. During 2013, 102 pinniped observations were recorded. Of these, 11 observations were of **harp seal** groups, 4 **bearded seals**, and 43 **walrus** groups. (IMR)

CETACEANS

Minke whales *Balaenoptera acutorostrata*

The Norwegian **minke whale** DNA register is a data base monitoring commercial harvest and trade of whale products. The register has also been used in a number of ad hoc scientific studies resulting through the accumulation of genetic, demographic and biological data. A pregnant female, captured in the North Atlantic in 2010, differed genetically from other whales in the register. Minke whales are separated into two genetically distinct species: the Antarctic minke whale found in the southern hemisphere, and the common minke whale which is cosmopolitan. All statistical parameters demonstrated that the pregnant female from 2010 was a hybrid displaying maternal and paternal contribution from North Atlantic common and Antarctic minke whales respectively. Her female fetus displayed greater genetic similarity to North Atlantic common minke whales than herself, strongly suggesting that the hybrid mother had paired with a North Atlantic common minke whale.This demonstrates, for the first time, that hybrids between minke whale species may be fertile, and that they can back-cross. (IMR)

The fatty acid (FA) composition were assessed in the blubber of 56 **minke whales** caught during the Norwegian commercial whaling in 2009-2011. Minke whales from four regions were sampled: The North Sea, Vesterålen, Spitsbergen/Bear Island and Finnmark. The FA profile of the whale blubber were compared with FA profiles of potential prey species to investigate if FA analysis can be used to predict the diet of minke whales and how the FAs profile of the blubber reflect the regional ecosystem in which the whale was caught. Clear differences were found in blubber FA profiles between minke whales from different areas, and the results confirm earlier studies that suggested a "three-geographic region model". Even though the FA profiles of minke whale inner layer blubber obviously are affected by the whale diet in the different areas, there were also found a strong impact from endogenous metabolism which may mask and dominate many of the dietary differences. The whale blubber FAs separates from the prey by having relative high levels of FAs likely to originate from endogenous metabolism, like chain shorting products of 22:1 (n-11) (20:1 (n-11) and 18:1 (n-11)), and 22:5 (n-3) which is a elongation product of 20:5 (n-3). It is also remarkable that the whale blubber have much lower levels of the long chain PUFAs 20:5 (n-3) and 22:6 (n-3) than found in the prey organism. It is likely that this is a result from selective partitioning of diet FAs between the storage lipids and membrane lipids. The results of this study indicate that the adipose tissue of the whale blubber is highly metabolism active and strongly determined the FA profile by endogenous metabolism. (IMR, UIT)

Chemical testing of oil from Minke whale and comparison with previously analyzed oils from whale blubber: White Paper 27 from 2005 points out the importance of utilizing the whole whale, including in addition to the meat, both blubber, heart and tripe. The blubber has previously been considered as the residual material with the greatest potential. Health effects of whale oil are not well described in the literature, but previous research conducted in part by NIFES and Haukeland University Hospital have shown that whale oil may be beneficial in the treatment of inflammatory bowel diseases. This is partly due to the high level of marine omega-3 fatty acids (eicosapentaenoic acid, EPA and docosahexaenoic acid, DHA) found in whale oils and various fish oils. In addition, sea mammals have a high content of imidazole related compounds such as balenine in muscle tissue. These compounds are postulated to have several positive biological functions but the scientific documentation is scarce.

The main objective of this project was to contribute to an overall assessment of applications for oil made from blubber and bones as well documenting the contents of positive components and level of contaminants in the various parts including meat from minke whale so that a better overall utilization of the whale can be achieved. This was done by determining the content of contaminants in various whale oils and documenting whether whale meat is a good source of balenine. During the project we have established a method for the qualitative

determination of balenine and we have documented the contents of balenine in products from different parts of the whale which have previously been less utilized. The results of the project have shown that the analyzed whale oils have a beneficial fatty acid profile which does not differ from previous analyzes of whale oil that gave positive health effects. New maximum limits for the concentration of polychlorinated biphenyls (PCB_6) and lower limits for dioxins and dioxin-like PCBs have turned out to be a challenge for unrefined whale oils. During the project it has become evident that whale oils must be refined before they can be used for human consumption. The results for balenine show very low concentrations in the fat-rich samples, but that elevated levels are present in the extracts from bone and in samples of muscle. It should be emphasized that the method developed is only qualitative and not quantitative, and it remains to validate the method. Our results have contributed to the building of a better knowledge base for achieving a higher utilization of the entire minke whale. An important prerequisite for this to succeed will be to document that balenine provide health benefits beyond what is currently known about the marine omega-3 fatty acids. If it turns out that balenine possesses unique health-promoting effects, these results will contribute to better utilization of whale resources, and thus increased value for the whaling industry. The results will also provide increased environmental benefits because the disposal of whale blubber and bone on the fishing grounds ceases. We plan to apply for a continuation of this project initiated by the Myklebust Hvalprodukter AS in Norway and partly financed by the Norwegian Seafood Research Fund (FHF) http://www.fhf.no/prosjektdetaljer/?projectNumber=900921. (NIFES)

During the periods 25 June to 15 July and 15 July to 18 August, sighting surveys were conducted with the institute vessel R/V *Håkon Mosby* and the chartered vessel M/S *Båragutt*, respectively, in the eastern Barents Sea Norwegian coast. The area which was covered is the IWC *Small Area EB* (eastern Barents Sea) which is part of the Medium Management Area E which comprises waters in the northeast Atlantic. This was the sixth and last year of the six-year program 2008-2013 to cover the northeast Atlantic to provide a new abundance estimate of **minke whales** every sixth year as part of the management scheme established for this species. A total of 3,613 nautical miles was surveyed with independent double platforms on primary effort. During primary search effort, the number of observations from the primary platform was 144 sightings of **minke whales**. Sightings of other cetacean species include **fin whales** (22 primary sightings), **humpback whales** (35 primary sightings), **harbour porpoises** (18 primary sightings), **Lagenorhynchus dolphins** (71 primary sightings), **beluga** (27 primary sightings), and **sperm whale** (9 sightings) (IMR).

Minke whale catch data for the 2013 season have been computerised and evaluated. (IMR)

Bowhead whale *Balaena mysticetus*
Biopsy samples of bowhead whales from western Greenland are continued to be analyzed using DNA techniques for analyses of population structure and size. A manuscript on the subject is under publication in MMS. (GINR, UWash., NHM).

Beluga whale *Delphinapterus leucas*
A list of the mammalian type specimens in the collection of the Natural History Museum, University of Oslo, has been compiled by Wiig and Bachmann. The collection contains the holotype and a paratype of the Galapagos fur seal (*Zalophus wollebaeki*) described by Sivertsen in 1953 and a syntype of *Delphinus leucopleurus* described by Rasch in 1843 but later withdrawn. (NHM)

Harbour porpoise *Phocoena phocoena*
An anatomical and histological description of the thoracic and intravertebral arterial retia of **harbour porpoises** has been made. Their location and organization suggests that they may be involved in freeing blood from nitrogen under supersaturated conditions, and thereby contribute to reduce the risk of intravascular nitrogen bubble formation and decompression sickness (Blix et al. 2013b). (UIT-AMB)

Other species
Killer whales *Orcinus orca*, **Sperm whales** *Physeter macrocephalus:* A study of possible interactions between **sperm whales** and **killer whales** took place in the Bleik canyon in the Vesterålen archipelago, North Norway. This area is a habitat for large solitary male sperm whales and killer whale pods. Using local whale-watching boats as opportunistic platforms and photo-identification as indirect method, the study examined the quantity and the nature of interactions between sperm whales and killer whales from 2008 to 2012. The results suggest that killer whale aggressions toward sperm whales are common in the area. The study shows that there are

significant annual, but not seasonal, variation in killer whale attacks on sperm whales. Killer whales do not display a selective biting of the sperm whale fluke, suggesting that all the parts of the fluke are equally likely to be attacked. (IMR, UIT)

Research vessels, coastguard vessels and other providers have collected incidental observations of marine mammals. Recorded data include date, position, species and numbers. During 2013 a total of 891 cetacean observation incidents have been reported. The most frequently observed species were **minke whales** (181 groups), **Lagenorhynchus dolphins** (234), **fin whales** (72), **humpback whales** (107), **killer whales** (120), **harbour porpoises** (64 groups), **blue whales** (4), **sperm whales** (29), **northern bottlenose whales** (7), **long-finned pilot whales** (18), **bottlenose dolphins** (1), **sei whales** (6), **common dolphins** (9 groups) and **narwhal** (1). (IMR)

During 2013 photo IDs have been collected from about 203 **humpback whales** during field work and from incidental sources. In addition, biopsy samples have been collected from 4 minke whales, and 30 humpback whales. (IMR)

During the period 19 August to 27 September 2013 mapping of whale distributions was conducted in connection with the annual ecosystem surveys in the Barents Sea. Data were collected by dedicated marine mammal observers following a line transect protocol on board the research vessels R/V *G O Sars*, R/V *Helmer Hansen* and R/V *Johan Hjort*. (IMR)

III ONGOING (CURRENT) RESEARCH

Analyses of **hooded seal** reproduction data (historical as well as new, sampled in 2008 and 2010) from the Greenland Sea are in progress. (IMR)

Analyses of historical and new data on demography and reproduction of **harp seals** in the Greenland Sea and Barents Sea / White Sea are in progress. (IMR)

Grey seal pup production was last surveyed along the Norwegian coast in 2006-2008. A new survey, aimed to give a new abundance estimate for the entire coast, was started in 2013 and will continue in 2014-2015.

Final analyses of **grey seal** diet data from the Norwegian coast are inm progress, an article will be submitted. (IMR)

Genetic and population studies of **harbour** and **grey seals** continue. (IMR)

Ecological studies designed to provide data on habitat use, diet and food consumption of **harbour seals** will be continued in North Norway. (IMR, UIT)

To try and develop a simpler way of describing **minke whale** diets (as compared with stomach sampling), the predator-prey relationship with respect to fatty acids is being studied in minke whales taken in the hunt in 2009-2011 in the North Sea, off Vesterålen, off Finnmark and in and in the Svalbard area. The analyses also compare fatty acid composition between the hunting areas. (IMR – UIT - NPI)

Comparison of the ecological role of **minke whales** and **harp seals** in the Barents Sea, using fatty acid composition and stable isotopes, are in progress. Material for the study was collected in 2011. (IMR – UIT - NPI)

Various aspects of **minke whale** genetics, using data from the Norwegian DNA register, are being studied in work in progress. (IMR)

Ship based registrations of **grey seal** pups, including tagging, counting and staging of pups, will be conducted in Nordland during the period September-November 2013. This is the second of a three year program aimed to provide a new abundance estimate for the species along the entire Norwegian coast from Rogaland county in the south to Finnmark county in the north. All known and many other potential whelping areas along the Norwegian coast will be surveyed. (IMR)

Previous studies in **hooded seals** have shown that their brain is unusually tolerant to lack of oxygen (hypoxia). Several potential mechanisms may underlie this phenomenon. One that is currently under investigation is that the release of excitatory neurotransmitters is blunted, while the release of inhibitory neurotransmitters may be enhanced, during exposure to hypoxia. This would put the brain in a less excitable state and hence reduce its energy costs and demand for oxygen. We are currently investigating this by use of both electrophysiological and biochemical approaches. (UIT-AMB)
Results from studies of chemical and histological changes in the liver of **hooded seal** pups during their initial nursing growth and the following post-weaning fast, to assess the metabolic functions of this organ in early life, are under way. (UIT-AMB)

B. pinnipedialis: Present studies aim to provide knowledge of a possible environmental niche of *B. pinnipedialis*. Experimental infection in cod will be performed along with further work with the infection assays in primary cod macrophages. Environmental samples (algae/phytoplankton, crustaceans) from the West-Ice area will be evaluated for the presence of marine *Brucella* spp. Survival of marine *Brucella* spp. in a sea-water model and protein expression profiling (proteomics) during starvation are currently investigated by our collaboration partner in Germany (Federal Institute of Risk Assessment (BfR), Berlin). (AIB)

Phocine distemper virus (PDV): Blood samples from harbour seals (Forlandet, Svalbard) will be investigated for presence of antibodies against phocine distemper virus (PDV). PDV usually gives respiratory disease in seals, but also symptoms from CNS, as seen during two major epizootics in Europe (1988 and 2002; "Seldøden"). A serological test (virus neutralization; VNT) is under establishment, which can be used also for other marine mammal species. (AIB)

Walruses *Odobenus rosmarus:* Camera surveillance of **walrus** haul-out sites continued. Digital cameras taking pictures hourly were deployed on 5 different walrus haul-out sites during the period late June - early October to study haul-out behaviour and potential impact of visiting tourists to these sites. (NP)

Two acoustic recorders (AURALs) listening for **bowhead whales** *Balaena mysticetus***, white whales** *Delphinapterus leucas* **and narwhals** *Monodon monoceros* (but also other species- and sounds) was deployed autumn 2012 and was retrieved during autumn 2013. One AURAL was deployed in the Framstrait, the other on the continental slope north of Svalbard. These two AURALs were redeployed at the same sites. In addition two new AURALs were deployed; one in the mouth of Kongsfjorden and one north of Rijpfjorden.(NP)

A new program on **white whales** was initiated with the goals of 1. Determine space use (satellite telemetry) over the entire annual cycle - to discern how these whales move in relation to sea ice, bathymetry, glacier fronts and oceanographic conditions, 2. Assess diet via stable isotope and fatty acid analyses bases on blood and blubber samples from live-captured whales, 3. Update the general health status of Svalbard's white whales based on screening of serum samples, 4. Conduct a screening of levels of various pollutants based on blood and blubber samples from live-captured whales. (NP)

Abundance data collected during recent sightings surveys on large whales and odontocetes are being analysed with respect to distribution and trend information. Whale sightings collected during ecosystem surveys are analysed with respect to relative abundance and distribution patterns. (IMR)

Local abundance, migration and habitat use of **humpback whales** in the Barents Sea are studied based on photo ID (IMR) and population structure by genetic analyses of biopsy samples (IMR and University of Gröningen, Palsbøll).

IV ADVICE GIVEN AND MANAGEMENT MEASURES TAKEN

Sealing

Advice on the management of harp and hooded seals is based on deliberations in the ICES Working Group on Harp and Hooded Seals (WGHARP). WGHARP met during 26-30 August 2013 at PINRO, Murmansk, Russia, to assess the status and harvest potential of stocks of Greenland Sea harp and hooded seals and harp seals in the White Sea. The advice given by ICES in September 2013, based on the 2013 WGHARP meeting, were used by the Joint Norwegian-Russian Fisheries Commission to establish management advice for 2014.

The basis for the advice was a request from Norway in September 2012 where ICES was requested to assess the status and harvest potential of harp seal stocks in the Greenland Sea and White Sea/Barents Sea and of the hooded seal stocks in the Greenland Sea, and to assess the impact on the harp seal stocks in the Greenland Sea and the White Sea/Barents Sea of an annual harvest of: 1) Current harvest levels; 2) Sustainable catches (defined as the fixed annual catches that stabilizes the future 1+ population); 3) Catches that would reduce the population over a 10-year period in such a manner that it would remain above a level of 70% of current level with 80% probability.

ICES have developed a Precautionary harvest strategy for the management of harp and hooded seals. The strategy includes two precautionary and one conservation (limit) reference levels. The reference levels relate to the pristine population size, which is the population that would be present on average in the absence of exploitation, or a proxy of the pristine population (which in practical terms is referred to as the maximum population size historically observed, N_{max}). A conservation, or lower limit reference point, N_{lim}, identifies the lowest population size which should be avoided with high probability. The first precautionary reference level is established at 70% (N_{70}) of N_{max}.When the population is between N_{70} and N_{max}, harvest levels may be decided that stabilise, reduce or increase the population, so long as the population remains above the N_{70} level. ICES has suggested that this could be done by designing the TAC to satisfy a specific risk criterion which implicate 80% probability of remaining above N_{70} over a 10-year period. When a population falls below the N_{70} level, conservation objectives are required to allow the population to recover to above the precautionary (N_{70}) reference level. N_{50} is a second precautionary reference point where more strict control rules must be implemented, whereas the N_{lim} reference point (set by ICES at 30% (N_{30}) of N_{max}) is the ultimate limit point at which all harvest must be stopped.

The ICES management of harp and hooded seals require that the populations in question are defined as "data rich". Data rich stocks should have data available for estimating abundance where a time series of at least three abundance estimates should be available spanning a period of 10-15 years with surveys separated by 2-5 years, the most recent abundance estimates should be prepared from surveys and supporting data (e.g., birth and mortality estimates) that are no more than 5 years old. Stocks whose abundance estimates do not meet all these criteria are considered "data poor", and should be managed more conservatively.

Population assessments were based on a population model that estimates the current total population size, incorporating historical catch data, estimates of pup production and historical values of reproductive rates. The modelled abundance is projected into the future to provide a future population size for which statistical uncertainty is provided for various sets of catch options. In case of "data poor" populations, catch limits are estimated using the more conservative Potential Biological Removal (PBR) approach.

Using the population assessment model, the size of the **Greenland Sea harp seal** population was estimated as 627 410 (95% C.I. 470 540 – 784 280) animals in 2013. ICES consider this population to be data rich, and above the N_{70} level (i.e., more than 70% of known maximum abundance measured). Thus, it is appropriate to provide catch advice using the assessment model and to apply the Precautionary harvest strategy. Current catch level will likely result in an increase in population size of 21% over the 10 years period 2013-2023, whereas a catch of 14 600 1+ animals, or an equivalent number of pups (where one 1+ seal is balanced by 2 pups), per year would sustain the population at present level over the same period. Catches that would reduce the population over a 10-year period in such a manner that it would remain above a level of 70% of current level with 80% probability are 21 270 1+ animals, or an equivalent number of pups (where one 1+ seal is balanced by 2 pups), in 2014 and subsequent years. Any allowable catch should be contingent on an adequate monitoring scheme to detect adverse impacts before it is too late for them to be reversed, particularly if the TAC is set at a level where a decline is expected.

Recent Russian aerial surveys of the **White Sea/Barents Sea harp** seal stock suggest that there may have been a drop in pup production of since 2003. As a result of the 2009 and 2010 surveys, ICES have suggested that the reduced pup production observed since 2004 does not appear to be a result of poor survey timing, poor counting of imagery, disappearance or mortality of pups prior to the survey or increased adult mortality. The most likely explanation for the change in pup production seems to be a decline in the reproductive state of females.

The population assessment model used for the White Sea/Barents Sea harp seal population provided a poor fit to the pup production survey data. Nevertheless, ICES decided to use the model which estimated a total 2013 abundance of 1 419 800 (95% C.I. 1 266 910 – 1 572 690) seals. Based on current data availability, the Barents Sea / White Sea harp seal population is considered to be "data poor". The modelled total population in 2013 is estimated to be about 83% of N_{max}. Current catch level will likely result in an increase in the population size of 13% over the 10 year period 2013-2023. The equilibrium catch level is 17 400 1+ animals, or an equivalent number of pups (where one 1+ seal is balanced by 2 pups), in 2014 and subsequent years. A catch level of 26 650 1+ animals, or an equivalent number of pups (where one 1+ seal is balanced by 2 pups) will bring the population size down to N_{70} with a probability 0.8 within 10 years. The PBR removals are estimated to be 40 430 (14% pups) seals. This catch option indicates a 16% reduction of the 1+ population over the next 10 year period. Despite the fact that this population is now classified as data poor, ICES expressed concerns over the high removals and declining population resulting from the PBR estimations, and concluded that the estimated equilibrium catches were the most preferred option.

Results from the most recent (2012) pup survey suggest that current **Greenland Sea hooded seal** pup production remains very low, and lower than observed in comparable surveys in 1997, 2005 and 2007. Due to some uncertainty regarding the historical data on pregnancy rates, the population model was run for a range of pregnancy rates (assuming that 50%, 70% or 90% of the mature females produced offspring, respectively). All model runs indicated a population currently well below N_{30} (30% of largest observed population size). Recent analyses have indicated that pregnancy rates have remained rather constant around 70% in the period 1958 – 1999. Using this scenario, the model estimates a 2013 total population of 82 830 (95% C.I. 67 104 – 98 573). Following the Precautionary harvest strategy and the fact that the population is below N_{lim}, ICES recommend that no harvest be allowed for Greenland Sea hooded seals at this time.

Traditionally, both Russia and Norway have participated in the sealing operations in the West Ice and the East Ice and have, therefore, allocated quotas on a bilateral basis in negotiations in the Joint Norwegian-Russian Fisheries Commission. However, the Russians cancelled their sealing operations in the West Ice in 2001. The Norwegian shares of the 2014 quotas would be the total TAC of harp seals in the West Ice. In the East Ice, the Norwegian quota was set at 7,000 harp seals.

In 1996 new regulations for the **coastal seal hunt**, including catch reports, were introduced. Quotas were set based on the available information on seal abundance along the coast. In 2003, quotas were increased substantially compared to the recommendations based on scientific advice, when they were set at 1186 grey seals (25% of abundance estimate) and 949 harbour seals (13% of abundance estimate). In 2003-2010, annual catches varied between 302-516 grey seals and 457-905 harbour seals. In 2010, new management plans for harbour and grey seals were implemented. The goal is to ensure sustainable populations of grey and harbour seals within their natural distribution areas. Regulating measures should be designed to ensure that they have the greatest impact in areas where there is documented significant damage to the fishing industry caused by seals. Target population sizes were decided to be 7000 harbour seals counted during moult and a grey seal population producing 1200 pups annually along the Norwegian coast. Hunting quotas should be set in order to regulate the seal populations in relation to the target levels. For 2011, quota for harbour seals was set to 460 and 230 seals were taken. For grey seals recommended quota was 460, set quota was 1040 but only 111 grey seals were taken. Compensations paid for shot seals were stopped for 2011. For 2012 and 2013, recommended and set quotas were 460 and 482 harbour seals, respectively, and 460 grey seals both years. Compensations paid for shot seals were again introduced in 2012 (250 NOK/seal): 355 harbour seals and 64 grey seals were taken in 2012: 483 harbour seals and 177 grey seals in 2013.

Whaling

At the IWC Annual Meeting in 1992 Norway stated that it intended to reopen the traditional **minke** whaling in 1993. So far, IWC has accepted the RMP developed by its Scientific Committee as a basis for future management decisions but has not implemented the procedure. The Norwegian Government therefore decided to set quotas for the 1993 and following seasons based on RMP, with parameters tuned to the cautious approach level as expressed by the Commission and using the best current abundance estimates as judged by the IWC Scientific Committee. In recent years research has been conducted on modification and retuning of the procedure to other target levels than the original 0.72, chosen by the Commission.

Starting in 2009, a new five-year block quota was set with an annual total catch quota of 885 animals of which 750 could be taken within the Northeastern stock area (the E Small Areas, i.e. the EW, EN, ES and EB Small Areas) and 135 within the CM area of the Central **minke whale** stock. The catch quotas are set for each of the five management areas, and the whaling within an area is stopped when this quota limit is reached. On the other hand, untaken quotas may be transferred to following years within the time period which the block quota is set for.

For 2013 the total catch quota was set to 1286 **minke whales**, the same as for 2012. The catching season opened April 1 and was closed medio September 2013.

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VI APPENDIX 1 – CATCH DATA

Sealing

Norwegian catches in the Greenland Sea in 2013 was taken by 4 vessels, whereas no Russian seal vessels participated in the area. Due to the uncertain status for Greenland Sea hooded seals, no animals of the species were permitted taken in the ordinary hunt operations in 2013. Only some animals were taken for scientific purposes. The 2013 TAC for harp seals in the Greenland Sea was set at 25 000 1+ animals (where 2 pups balance one 1+ animal), i.e. the removal level that would reduce the population with 30% over the next 10 year period.

A possible reduction in harp seal pup production in the White Sea may have prevailed after 2003. Due to concern over this, ICES recommended that removals be restricted to the estimated sustainable equilibrium level of 15,827 1+ animals (where 2 pups balance one 1+ animal) in the White and Barents Sea in 2013. The Joint Norwegian-Russian Fisheries Commission has followed this request and allocated 7,000 seals of this TAC to Norway.

Table IV.I shows the Norwegian catches of harp and hooded seals in 2013. The total quotas given were not fulfilled in any area: In the West Ice, 54% of the harp seal quota was taken. Russian sealing in 2013 was planned to be continued using the new boat-based approach introduced in the White Sea catch in 2008. This catch, using ice class vessels fitted with small catcher boats, would focus primarily on weaned pups (beaters), to a much less extent on adult seals. No white-coats would be taken. However, as was also the case in 2009-2012, Russian authorities implemented a ban of all White Sea pup catches. Despite considerable effort from PINRO specialists to explain that a sustainable harvest from the population would be perfectly possible, the Russian authorities concluded that all pup catches in the White Sea should be banned in 2013. Due to this, there were no commercial Russian harp seal catches in the White Sea in 2013. No Norwegian vessel aimed for this hunting area in 2013.

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