



# **Annual Report 2013**

North Atlantic Marine Mammal Commission

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## CONTENTS

|  |          |
|--|----------|
| <b>COMMITTEES &amp; OFFICE BEARERS .....</b> | <b>5</b> |
|--|----------|

### **SECTION 1            COUNCIL**

|   |           |
|---|-----------|
| <b>1.1     Report of the Twenty Second Meeting of the Council .....</b>                                   | <b>9</b>  |
| Appendix 1     Agenda .....   | 22        |
| Appendix 2     List of Documents .....  | 23        |
| Appendix 3     Opening Statements .....   | 25        |
| Appendix 4     Audited Accounts for 2011 .....  | 29        |
| Appendix 5     Rules of Procedure for the Committee on Inspection and Observation .....                   | 30        |
| Appendix 6     Press Release .....  | 32        |
| <b>1.2     Report of the Committee on Hunting Methods .....</b>   | <b>35</b> |
| Appendix 1     List of Laws and Regulations for Marine Mammal Hunting in NAMMCO<br>Member Countries ..... | 42        |
| Appendix 2     List of references on Hunting methods .....  | 44        |
| <b>1.3     Report of the Committee on Inspection and Observation .....</b>                                | <b>49</b> |

### **SECTION 2            MANAGEMENT COMMITTEES**

|  |           |
|--|-----------|
| <b>2.1     Report of the Management Committee for Cetaceans .....</b>                                    | <b>55</b> |
| Appendix 1     Agenda .....  | 67        |
| Appendix 2     List of Documents .....   | 70        |
| Appendix 3     Recommendations to member countries .....   | 71        |
| <b>2.2     Report of the Management Committee for Seals and Walruses .....</b>                           | <b>73</b> |
| Appendix 1     Agenda .....  | 81        |
| Appendix 2     List of Documents .....   | 83        |
| Appendix 3     Recommendations to member countries .....   | 84        |
| ANNEX 1     List of current Proposals for Conservation and Management .....                              | 85        |
| ANNEX 2     Summary of current Requests by Council to the Scientific Committee and its<br>Response ..... | 114       |

### **SECTION 3            SCIENTIFIC COMMITTEE**

|  |            |
|--|------------|
| <b>3.1     Report of the Twentieth Meeting of the Scientific Committee .....</b> | <b>153</b> |
| Executive summary .....  | 155        |
| Main Report .....  | 165        |
| Appendix 1     Agenda .....  | 206        |
| Appendix 2     List of Documents .....   | 209        |

|         |   |     |
|---------|---|-----|
| ANNEX 1 | Report of the NAMMCO Scientific Working Group on Harbour Porpoises .....  | 211 |
| ANNEX 2 | Report of the NAMMCO Scientific Committee Working Group on Walruses ..... | 229 |

#### **SECTION 4                NATIONAL PROGRESS REPORTS**

|            |  |            |
|------------|--|------------|
| <b>4.1</b> | <b>Faroe Islands Progress Report on Marine Mammals .....</b> | <b>241</b> |
| <b>4.2</b> | <b>Greenland Progress Report on Marine Mammals .....</b>     | <b>245</b> |
| <b>4.3</b> | <b>Iceland Progress Report on Marine Mammals .....</b>       | <b>253</b> |
| <b>4.4</b> | <b>Norway Progress Report on Marine Mammals .....</b>        | <b>267</b> |

#### **SECTION 5                ADDRESSES**

|            |  |            |
|------------|--|------------|
| <b>5.1</b> | <b>Delegates and Observers to the Twenty Second Meeting of the Council .....</b> | <b>289</b> |
| <b>5.2</b> | <b>Council Members .....</b>   | <b>293</b> |
| <b>5.3</b> | <b>Management Committee Members .....</b>  | <b>295</b> |
| <b>5.4</b> | <b>Scientific Committee Members .....</b>  | <b>297</b> |
| <b>5.5</b> | <b>Hunting Committee Members.....</b>  | <b>299</b> |
| <b>5.6</b> | <b>NAMMCO Scientific WG on Harbour Porpoises .....</b>                           | <b>301</b> |
| <b>5.7</b> | <b>NAMMCO Scientific WG on Walruses .....</b>                                    | <b>303</b> |
| <b>5.8</b> | <b>Secretariat.....</b>  | <b>305</b> |

## COMMITTEES AND OFFICE BEARERS

### Members of the Commission

|               |     |
|---------------|-----|
| Faroe Islands | (F) |
| Greenland     | (G) |
| Iceland       | (I) |
| Norway        | (N) |

### Councillors

|   |
|---|
| Mr Ernst Olsen (from February 2014); Ms Hanna í Horni |
| Ms Amalie Jessen                                      |
| Ms Ásta Einarsdóttir                                  |
| Mr Ole-David Stenseth                                 |

### Council

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

### Committee on Hunting Methods

|                 |                      |                        |
|-----------------|----------------------|------------------------|
| <i>Chairs –</i> | <i>1994-1998</i>     | Ms Amalie Jessen (G)   |
|                 | <i>1998-2005</i>     | Mr Jústines Olsen (F)  |
|                 | <i>2005-2012</i>     | Dr Egil Ole Øen (N)    |
|                 | <i>2012. . . . .</i> | Mr Eyþór Björnsson (I) |

### Committee on Inspection and Observation

|                 |                      |                            |
|-----------------|----------------------|----------------------------|
| <i>Chairs –</i> | <i>1993-1995</i>     | Mr Einar Lemche (G)        |
|                 | <i>1995-2005</i>     | Dr Egil Ole Øen (N)        |
|                 | <i>2005-2011</i>     | Mr Ole Heinrich (G)        |
|                 | <i>2011-2012.</i>    | Mr Eigil Tofte Bjørvik (G) |
|                 | <i>2012. . . . .</i> | Ms Nette Leverman (G)      |

### Finance and Administration Committee

|                 |                      |                          |
|-----------------|----------------------|--------------------------|
| <i>Chairs –</i> | <i>1999-2000</i>     | Mr Øyvind Rasmussen (N)  |
|                 | <i>2000-2005</i>     | Mr Einar Lemche (G)      |
|                 | <i>2005-2009</i>     | Ms Ásta Einarsdóttir (I) |
|                 | <i>2009-2012</i>     | Ms Kate Sanderson (F)    |
|                 | <i>2012. . . . .</i> | Mr Einar Tallaksen (N)   |

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

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

### Management Committee for Cetaceans

|                 |                      |                          |
|-----------------|----------------------|--------------------------|
| <i>Chairs -</i> | <i>2008-2012</i>     | Ms Ásta Einarsdóttir (I) |
|                 | <i>2012. . . . .</i> | Ms Ulla Wang (F)         |

### Management Committee for Seals and Walruses

|                 |                      |                      |
|-----------------|----------------------|----------------------|
| <i>Chairs –</i> | <i>2007-2011</i>     | Ms Amalie Jessen (G) |
|                 | <i>2011. . . . .</i> | Ms Hild Ynnesdal (N) |

### Scientific Committee

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

# **Secretariat**

*General Secretary*

*Scientific Secretary*

*Deputy Secretary*

Dr Christina Lockyer

Ms Jill Prewitt

Ms Charlotte Winsnes

## SECTION 1 - COUNCIL

|            |  |           |
|------------|--|-----------|
| <b>1.1</b> | <b>Report of the Twenty Second Meeting of the Council .....</b>  | <b>9</b>  |
|            | Appendix 1    Agenda .....   | 22        |
|            | Appendix 2    List of Documents .....  | 24        |
|            | Appendix 3    Opening Statements .....   | 25        |
|            | Appendix 4    Audited Accounts for 2011 .....  | 29        |
|            | Appendix 5    Rules of Procedure for the Committee on Inspection and Observation .....                   | 30        |
|            | Appendix 6    Press Release .....  | 32        |
| <b>1.2</b> | <b>Report of the Committee on Hunting Methods .....</b>  | <b>35</b> |
|            | Appendix 1    List of Laws and Regulations for Marine Mammal Hunting in NAMMCO<br>Member Countries ..... | 42        |
|            | Appendix 2    List of references on Hunting methods .....  | 44        |
| <b>1.3</b> | <b>Report of the Committee on Inspection and Observation .....</b>                                       | <b>49</b> |





**1.1**  
**REPORT OF THE TWENTY SECOND MEETING OF THE COUNCIL**  
**25 – 27 February 2014, Oslo, Norway**

**1. OPENING PROCEDURES**

**1.1 Welcome address**

The meeting was opened with a welcoming address by the Chair of Council, Ásta Einarisdóttir.

Following this, participants (NAMMCO/22/1; Address Section 5.1) 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 Association of Traditional Marine Mammal Hunters of Chukotka (ATTMHC).

A number of regrets had been received, including the EU (both EC-DG Maritime Affairs and Fisheries and EC-DG Environment), North Atlantic Salmon Commission (NASCO), Agreement on Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBANS), UN Food and Agriculture Organization (FAO – RSN division), Commission on International Trade in Endangered Species (CITES) and the Inuit Circumpolar Conference (ICC).

**1.3 Opening statements**

Opening statements were presented by member nations of the Faroe Islands, Greenland, Norway and Iceland; Canada and Japan also made an opening statement. All statements are contained in Appendix 3.

**1.4 Adoption of agenda**

The agenda (NAMMCO/22/2) was adopted without amendments (Appendix 1). Documents relating to the agenda points are listed in Appendix 2. Japan requested the opportunity to raise a matter under agenda point 12, which was agreed.

**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 reception, to be hosted by the Secretariat, in the Grand Hotel on the evening of the 25 February.

**2. FINANCE AND ADMINISTRATION**

**2.1 Report of the Finance and Administration Committee (FAC)**

The Chair of the FAC, Einar Talakksen (Norway), presented the report of meetings held during 2013 (NAMMCO/22/4) and 2014 back to back with NAMMCO 22, comprising three face-to-face meetings and three teleconference meetings. He highlighted the main items requiring a decision by the Council. He explained that the budget 2014 and draft budget 2015 would remain open until after the conclusion of the meetings of the Management Committees and their recommendations and requests were available.

The size and idea of the general reserve had been discussed and the FAC 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). In light of the tight financial situation facing all member countries the recovery plan should be achieved without increasing member contributions beyond inflation adjustments. Starting in 2015 an annual allocation to the recovery of the General Reserve would be set aside within the budget.

## Report of the Council

Regarding T-NASS 2015 there had been difficulties over agreement on the sharing of expenses. National core activities under T-NASS would be covered by individual member states, but extra survey zones proposed were problematic for finance. The required funding was not ensured in 2013, and there remain uncertainties. The go-ahead for planning of T-NASS 2015 was however given.

A planning group with the aim of highlighting Food Security with respect to Marine Mammals, the idea for which was initiated at the Ministerial meeting in Svolvær, Norway, in September 2012, was established with Greenland as Chair (Amalie Jessen).

A welcome was extended to the new Scientific Secretary (Jill Prewitt).

From 2014 all NAMMCO publications would only be online, exception given to the Scientific Publication on Walrus which was in its last phase.

Finally, the FAC had been tasked with approving the Rules of Procedure (RoP) for the Committee on Inspection and Observation.

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 2012 and 2013**

The Chair highlighted that the 2013 accounts (NAMMCO/22/4.1) had closed with a surplus of close to 192,000 NOK. In general, NAMMCO expenses had been less than anticipated during 2013 due to postponement of activities like T-NASS Steering Committee meetings and the publication on Walrus. The accounts had been audited by Price-Waterhouse Coopers, Tromsø, who had raised some queries but otherwise had approved the accounts. The signatures of both the General Secretary and the Chair of NAMMCO were now required. The auditors subsequently approved and signed off on the accounts.

#### **Comments:**

Greenland thanked the Secretariat for its work to render the accounts more understandable through explanations, although there were still a few challenges to follow the expenditures.

The accounts (NAMMCO/22/4.1; Appendix 4) were approved and **adopted** by Council.

### **2.3 Budget 2014 and Draft Budget 2015**

The Chair introduced the revised 2014 budget and draft budgets for 2015 (NAMMCO/22/4.2 revised). Explanations of the budget lines and the rationale for determining them were presented. In 2014, some changes had now been agreed with the Secretariat on the non back-dating of pension contributions for senior staff members as an interim solution pending the outcome of a revisiting of the pension scheme in lieu of increased administration costs and new regulations in Norway. Decisions were made regarding eventual saving of printing expenses of the future Scientific Publications series after 2014 by maintaining only online publication. In 2014, additional expenses were required for computer equipment for Secretariat staff, and T-NASS coordination. Expenses were also needed for the recruiting process for a new General Secretary to be employed early in 2015. Money was allocated to the planning group dealing with Marine Mammals in the context of Food Security. External funding would also be sought for this (through NORA and the Nordic Council). National contributions were also anticipated increasing 2% in line with inflation in 2015. These had remained stable for some years. 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.

The Council adopted the revised budget 2014 and the draft budget 2015 as contained in NAMMCO/21/4.2 revised.

### **2.4 Other business**

#### **The Inspection and Observation Committee Rules of Procedure (RoP)**

The Deputy Secretary introduced the RoP (NAMMCO/22/4 Annex 1). These RoP were based on the existing ones for other committees like the Hunting Committee. The Council **adopted** the Rules of Procedure as contained in (Appendix 5) without changes.

### **3. SCIENTIFIC COMMITTEE**

#### **3.1 Report of the Scientific Committee (SC)**

The Chair of the Scientific Committee (Þorvaldur Gunnlaugsson, Iceland) introduced relevant parts of the SC report (NAMMCO/22/5; Section 3). He highlighted the activities of the SC since mid-2012. There had been Working Group meetings on harbour porpoise and walrus in November 2013 in the days preceding the main SC meeting. In addition there had been work in the T-NASS Steering Committee, and he also reported on new pilot whale tagging results and contract work on acoustics data, both items being relevant to survey and abundance.

Involvement with the ICES Harp and Hooded seals Working Group had continued (formerly the ICES/NAFO WG), and it was proposed that a stronger and more formal affiliation with ICES should be sought in this WG. The Secretariat reported that since the signing of the Letter of Agreement with ICES on scientific collaboration at the end of 2011, it would be appropriate to formalise links in this and also other marine mammal working groups in ICES. The Secretariat will explore this possibility.

With the Pilot Whale Working Group there had been recommendations for new work. The Icelandic Minke Whale Research Program had already been reviewed in the IWC SC and would be further discussed in the Management Committee for Cetaceans.

Contract work on the Acoustic Report from T-NASS 2007 had been completed, but the findings were disappointing. Identification by species was limited and there had been few sperm whales recorded.

There had been Bowhead whale mark-recapture research using genetic identity that was promising.

For Grey seals, there had been stock identification studies and modelling work in Norway.

#### **3.2 Trans-North Atlantic Sightings Survey (T-NASS 2015)**

The Chair of the Steering Committee on T-NASS (Mads Peter Heide-Jørgensen, Greenland) presented NAMMCO/22/6. The areas to be covered had been decided upon with a focus on species and areas of special interest rather than the entire North Atlantic. In contrast to previous surveys in the NASS series there would be a focus on particular stocks. Three species were the main target – minke, fin and pilot whales. The priority is minke whale – Iceland and Greenland – which is also of importance in the IWC abundance and assessments. There would be a goal for a new updated abundance estimate for pilot whale in respect of sustainability of the Faroese hunt.

The areas to be covered – West Greenland and Icelandic coastal areas and one block of the North Atlantic are anticipated to be covered by national surveys. It is also critical to cover the Jan Mayen area – to be covered by Iceland – to elucidate possible movements of whales from coastal areas to pelagic ones. The Greenlandic areas off East Greenland (normally ice-covered) would be important to assess coastal whale presence. Coverage of the entire North Atlantic was not necessarily helpful for assessment of stocks important for member countries.

Tagging of pilot whales with satellite transmitters has provided information on movements and distribution of the species in the North Atlantic. Group size estimation of pilot whales was difficult in practice. Group size estimation has strong influence upon the abundance estimate and needs careful consideration in survey design.

Decisions about the year and target survey areas had indicated the level of effort that would be required.

Primary costs are the sighting platforms. In all, 1.74 million sq. n.mi of survey area are to be covered. National funding is necessary and also additional funding. The proposed areas off East Greenland and north of Iceland (Jan Mayen) and the pilot whale areas north and south of the Faroes, all require extra

funding. These require additionally 20% of total costs of the overall budget, a substantial amount. It was not possible to obtain extra funding from traditional research councils, as T-NASS was in the category of applied science.

In 2013, the proposal had been forwarded to the FAC for funding support but commitment had not been finalised. The Steering Committee has now developed a more detailed project with details of survey design, *etc.* East Greenland will be an aerial survey. The Jan Mayen area will be covered by ship-based surveys and utilise the Norwegian mosaic survey design. For Pilot whales there will be more satellite tracking and ship-based surveys; unmanned model aircraft - drones – would be employed to estimate group size. In all, there would be three projects. Results from these projects will be the property of NAMMCO. This now requires approval of the FAC, and subsequent endorsement by Council for progress to be made. It was emphasised that with only partial funding, postponement of parts of the survey design may ensue.

**Comments:**

Norway thanked the T-NASS Steering Committee and its Chair for their work and the presentation. An elaboration on likely extension beyond the areas presented – *e.g.* involvement of Russia and Canada – was requested. Involvement of Canada and Russia is not crucial for NAMMCO work. However, Russian cooperation is anticipated. It was emphasised that all survey methods MUST be standardised with NAMMCO methods in order to get robust results and assessments.

Greenland thanked the Steering Committee Chair for the presentation on T-NASS.

Russia reported that they cover the areas of Spitsbergen and Greenland *via* ecosystem surveys in the Barents Sea and the North Atlantic, but that these surveys are for distribution analysis and not for abundance *per se*.

Norway noted that the protocol in Russia is different from NASS. Norway will in fact cover Spitsbergen as part of the mosaic survey this year (2014).

**3.3 Priorities and Work plan of the Scientific Committee in 2014-2015**

A number of Working Groups were suggested by the SC, and included also participation in the ICES Science Conference in Spain, September 2014, where a session on top predators and climate change would take place. This would be organised by the NAMMCO SC Vice-Chair, and it would be useful for NAMMCO scientists to participate.

In the future – 2015 – it was suggested that a workshop on disturbance to narwhal and belugas as well as walrus should be organised, to address the pending requests from Council. The IWC was holding a disturbance workshop on cetaceans in the Arctic, in Anchorage, Alaska, 6-7 March 2014, which might generate ideas for the planning of the NAMMCO workshop.

Also, a Global Workshop on Monodontids, originally proposed as a cooperative event by the IWC, was suggested with NAMMCO taking the lead in convening the workshop, to be held back to back with the marine mammal conference in St Petersburg, in 2016. It would provide an opportunity to incorporate Russian scientists.

**Comments:**

- Norway explained the background for the IWC initiative in holding a Global Monodontid Review. Monodontids have been a priority for the IWC Small Cetacean Subcommittee for many years. The intention is that this review should be purely scientific and not be management oriented. In the past there has been a joint workshop between IWC and NAMMCO scientists on North Atlantic fin whales. The Beluga has circumpolar distribution. Both Beluga and Narwhal are also of multinational concern. Such a workshop should have participation by all range state nations - Canada, USA, Russia, Norway and Greenland.
- Referring to global monodontid issues, Greenland has reservations on involving the IWC in small cetacean issues. From Greenland's viewpoint (also NAMMCO) there were doubts about

involving the IWC. Greenland has no reservations about workshops on science of belugas and narwhals involving relevant countries, however.

- The Faroes and Iceland agree with Greenland regarding reservations about IWC involvement in small cetacean matters.
- Norway shares the reservations regarding the IWC. However, Norway emphasised the difference between the Scientific Committee and the Commissioners of the IWC.

In conclusion, there was no consensus of opinion regarding the cooperation with the IWC, and rather than strike such a workshop from the future agenda, it was agreed to discuss a way forward by correspondence. It was noted that should such a workshop be held in the future, Canada would be willing to participate with scientists, but would like to be consulted regarding any planning.

#### **Work Plan of the SC for 2014:**

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 2014 with indications of priorities in 2015. The approved work plan is presented below.

- 1) **T-NASS Steering Committee:** Planning meeting: early 2015 *Chair: Mads Peter Heide-Jørgensen*

#### **Survey Planning Working Group: Summer/Fall 2014**

*Chair: Þorvaldur Gunnlaugsson*

The costs for these meetings are incorporated into the T-NASS 2015 budget

- 2) **Beluga/Narwhal Catch Allocation Meeting (as part of the SC JWG NAMMCO / JCNB):** 10-12 March 2014, Copenhagen.

This group should ensure a useful catch allocation model given the current knowledge and data, and it would report back to the JWG at its next meeting. *Convenor: Mads Peter Heide-Jørgensen; NAMMCO Chair: Rod Hobbs.*

- 3) **Large Whale Assessment Working Group:** Fall 2014, Reykjavik.

As the present advice expires in 2015, the NAMMCO SC **agreed** to convene 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. *Convenor: Gísli Víkingsson; Chair: Lars Walløe.*

**The following meetings are scheduled to occur after the next SC meeting, likely in 2015 or later:**

- 4) **Coastal Seals WG:** Late 2014/early 2015

The SC **recommended** that the Grey and Harbour Seals WG meet in late winter 2014 or early 2015 to finalise the **requests 2.4.2 and 2.5.2**. The WG meeting should assess the status of all populations, particularly using new abundance estimate data that are available from Iceland and Norway. The meeting should also address by-catch issues (grey seals) in Norway, Iceland, and the Faroe Islands, and a re-evaluation of the Norwegian management plans (which have been already implemented) for grey and harbour seals. It will also be advisable to include participation from at least Canada, UK, and the Baltic Sea countries. *Chair: Kjell Tormod Nilssen*

- **Scientific symposium on disturbance effects on narwhals and belugas:** Early 2015.

To address **R-3.4.9**, the Management Committee **supports** the continued planning of the disturbance workshop for beluga and narwhal, and would also **recommend** including walrus as well (**R-2.6.3**).

## Report of the Council

- A **Ringed Seals WG** will be considered at the next SC meeting. To be held 2015 or later.

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 the report from that meeting, and data availability, and considers a WG after the next SC meeting

### 3.4 Other business

There was no other business.

## 4. NATIONAL PROGRESS REPORTS

All National Progress Reports (NPR) had been received from member countries (NAMMCO/22/NPR-F, NAMMCO/22/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.

The General Secretary informed that in consultation with Greenland, the format of the NPR had been changed in the latter part of 2013, and a special format had been developed for submitting catch statistics which should be submitted separately as an Appendix. These data will be extracted and compiled in a catch database accessible to members – eventually online, once the new website has been installed. Greenland enquired why other members had not used this format, and the Secretariat explained that other members had submitted their NPR before the new format had been discussed and approved at the SC meeting.

### Comments:

Greenland raised a number of questions regarding specific points in member NPRs, but the Chair requested such discussions to be raised in the Management Committees.

Greenland informed that since the NPR had been submitted, a status had changed. Referring to the press release (by the former minister) announcing unlimited quotas in Qaanaaq in August 2013, this is now not being implemented and Greenland will inform NAMMCO about new developments.

## 5. MANAGEMENT COMMITTEE FOR CETACEANS

### 5.1 Report of the Management Committee for Cetaceans

The Chair of the Management Committee for Cetaceans, Ulla S. Wang (Faroe Islands), presented the report (NAMMCO/22/7; Section 2.1). 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. There was one new request (see item 5.2 below).

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

### 5.2 Recommendations for requests for advice

There was a new request addressed to the Scientific Committee.

- **R-1.7.12:** Greenland requests the SC to give information on sustainable yield based on new abundance estimates expected from T-NASS 2015 for all large baleen whales (Fin, Minke and Bowhead whales) in West Greenland waters.

The Council **endorsed** this request which would be pending until after T-NASS 2015.

### 5.3 Other business

There was no other business.

## **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/22/8; 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, or requests for advice from the Scientific Committee.

The Council took note of the recommendations for further research on walruses, identified by the Scientific Committee and endorsed by the Management Committee, noting that this recommendation is directed to an individual member country for appropriate action.

The Council noted that Greenland had agreed to send a new request to ICES in order to finalise 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.

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

### **6.2 Recommendations for requests for advice**

There were no new recommendations.

### **6.3 Any other business**

#### **Trade Issues and the EU Ban on importation of sealskin**

The Council noted the full discussion on the EU seal ban in the Management Committee, and agreed to raise this matter in the press release from the Council meeting (refer to Appendix 6).

## **7. HUNTING METHODS**

### **7.1 Report of the Committee on Hunting Methods**

The Chair of the Committee on Hunting Methods, Eypór Björnsson (Iceland) presented the report (NAMMCO/22/9; Section 1.2). He announced a correction in the report on catch figures for Icelandic fin whales – 134 and **including** 5 struck and lost. He continued summarising the main points, pointing out that the manual on hunting of marine mammals would be dealt with in detail under agenda item 7.2.

- **Update of rules and regulations pertaining to the hunt** – There was a new Executive Order on pilot whaling with endorsement of the spinal lance and new blowhole hook as proper standard equipment in the Faroe Islands. For Iceland and Norway, there had been no new regulations in 2013.
- **Data and the hunt** – Norway reported that Time to Death (TTD) data from the minke whale hunt had been collected in 2011 and 2012, and on seals in 2013. These are planned to be presented in 2014. Iceland plans to record TTD data on minke and fin whales in the hunt in 2014. Greenland catch data were collected on large whales 2005 – 2012.

With respect to collection and presenting TTD data, the Committee recommended that all member countries use the same methods and form for reporting of TTD data. It was suggested to use the Norwegian method as a standard.

- **Manual on hunting of marine mammals** – Presently this has been prepared in two parts and has been issued in English which will be the version made available on the NAMMCO website. The manual will be translated appropriately for local use in member countries. The possibility of external funding for this will be investigated by the Secretariat. **Member countries are responsible** for how and in which form it will be distributed to the hunters. The Committee recommended that member countries initiate procedures to ensure that hunters receive a manual and that there are mechanisms in place to ensure that the hunters are familiar with the content of

## Report of the Council

the manual prior to hunting. The budget attracted funding of 150,000 NOK from the Norwegian ministry of Foreign Affairs and NOK 75,000 from the Nordic Atlantic Cooperation (NORA),

Council **endorsed** the recommendations from the Committee on Hunting Methods, noting especially that future voluntary reporting of TTD data to the Committee should be modeled around the Norwegian manner of presenting these kinds of data, and tasked the Hunting Committee to organize a seminar to focus on data collection, analysis and presentation.

### 7.2 Manual on Hunting of Marine Mammals

Egil Øen (Norway) presented the Manual on hunting of marine mammals, comprising:

- Manual on the maintenance and use of weaponry and equipment employed in the killing of baleen whales (NAMMCO/22/10A)
- Manual on pilot whaling (NAMMCO/22/10B).

He commenced with a reference to the preface regarding the right of local coastal peoples to hunt and that this right is also connected to the obligation for hunters and authorities to conduct the hunt in a sustainable manner maximising hunters safety and minimising animal suffering. He informed that comments on the manual had been incorporated from both whalers and weaponry producers who had been consulted during the process and had been invited to comment on the texts. Although the manuals are in English, they will be translated and issued in relevant native languages for all members.

The manual on the baleen whales covers fin, minke, humpback and bowhead whales. It describes maintenance and use of the weapons; cannons, harpoons, explosive grenades and also rifle and ammunition. It also describes the anatomy of the whales and target sites.

The manual structure is in three parts - information that one **MUST** know; information that one **SHOULD** know and information that one may find **USEFUL** to know. The focus was on safety information.

The manual addressing pilot whale hunting– describes the use and design of the spinal lance and the blowhole hook and also gives details on criteria assessing death. Jústines Olsen (Faroe Islands) had been instrumental in preparing document.

Øen emphasised the efforts of the Secretariat and the Hunting Committee in the development of the manual.

#### **Comments:**

Norway thanked Egil Øen for his presentation and the work on the manual. Thanks also were extended to the Hunting Committee. This work would be a standard reference for member countries.

The Faroe Islands commended the work, and welcomed the instruction and will ensure that it is implemented.

Greenland concurred with Norway and the Faroe Islands. This was a great work undertaken. Video footage used from previous era had been useful, but the new manual will now be a very positive instrument. Greenland anticipates reaction to the manual, along with some criticisms. Comments may come from the IWC Commission.

Norway stated that whale hunters had established the Small Whalers' Union in 1993 when whaling started again. There have been three serious accidents involving the whaling cannon, and although no deaths, very serious injuries. There have also been some smaller incidents. In accidents, the police and Øen had reviewed data. In these circumstances, the whalers did not follow instructions properly. This was the conclusion from the Norwegian authorities and Small Whalers' Union. After 2012, these bodies looked to the safety for whalers onboard, finding different ways to regulate the situation and get whalers to accept instruction.



The manual (handbook) was thus very welcome, and the Small Whalers' Union had commented on the result and, together with the authorities, had found it exactly as required. The Small Whalers' Union will inform all whalers that this is THE manual and instructions MUST be followed.

NAMMCO was thanked by the Small Whalers' Union for its good work and congratulated on the resulting manual which will be useful for all NAMMCO member countries, and provide better safety as a result.

Japan informed that it has been submitting hunting data to NAMMCO since 2009 and not to the IWC. Japanese scientists participate in the NAMMCO SC, so cooperation with NAMMCO takes place at many levels. Japan wish to continue this cooperation and develop this in the future.

Finally, Iceland especially thanked Egil Øen and Jústines Olsen for their excellent work. The Chair also thanked Egil Øen, Charlotte Winsnes and Hild Ynnesdal for their dedicated and excellent work.

### **7.3 Other business**

No comments.

## **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/22/11; Section 1.3) that related to two meetings – one in 2013 and one just prior to the Council meeting in 2014. Items referred to were the implementation of the observation scheme in 2012, where pilot whaling in the Faroe Islands was observed, and 2013, where whaling in Iceland and Norway was observed. No violations were reported.

There had been discussion and a decision to prepare information on the work of the Committee on Inspection and Observation and the types of hunts in the NAMMCO member countries and forms for observer reporting on the NAMMCO web site. However, actual observer reports should not be made available /public online.

The Committee had organised a training course for observer candidates in March 2013 in Reykjavik, Iceland. The feedback from participants was that despite some language barriers, the course had been very informative and constructive. A new course would be scheduled in 5 years' time.

The Committee had developed a template for CVs of candidates wishing to act as observers in order to standardise the information given. Furthermore member countries would be reporting on national monitoring annually.

Draft Rules of Procedure had been prepared for the Committee with two changes made in the version vetted by the FAC – limiting participation to two national delegates, which was queried by the Committee. However, approval was required by Council for the adoption of these RoP.

Although the Secretariat is responsible for deciding matters of where observers are placed in any season, the Committee recommended increased effort in the 2014 season with a focus on the seal hunt in Norway with an appropriately increased budget.

#### **Comments:**

Greenland requested confirmation that no observer reports would be made public. Only report templates will be online but not completed ones.

Norway proposed changes to the draft RoP, and this matter was discussed in the FAC. However, the version shown in Appendix 5 was later **adopted** by Council (see above under item 2.4).

### **8.2 Other business**

#### **Report of the Observation Scheme in 2013**

## Report of the Council

The Deputy Secretary, Charlotte Winsnes, reported on the implementation of the 2013 observation activities (NAMMCO/22/14). The focus had been on minke and fin whaling in Iceland, and minke whaling in Norway. A total of 4 minke and 4 fin whales had been observed in Iceland by one observer, and also flensing onboard and landings. Two different whaling boats were contracted in Norway for the observations, using two observers, when 8 whales were caught (1 was lost) and landings observed. No violations were reported. All observers had participated in the March 2013 training course.

### **Comments:**

Council took note of the report and recommended that in future this topic should be a separate agenda item and not under Other Business.

## **9. ENVIRONMENTAL QUESTIONS**

### **Harp seals in the Barents Sea**

Norway reported on harp seals in the Barents Sea where there had been a heavy hunt in post war years but little in the period of the late 1960s and recent years. A decrease in body condition including blubber thickness had been recorded. Tagging data allowing tracking for monitoring distribution had been available since the 1990s. Data had been collected from two areas from 1996 onwards. Krill and polar cod are the main summer food resource for harp seals. No seals occur outside Spitsbergen and instead they occur only on the northwest side which may be a good area for resting but not for feeding. Changes in body condition and distribution are not just climate change issues but also reflect the seals' requirement for actual space. When cod expands in an area this is not good for seals. Krill availability equals thicker blubber while polar cod equals low body condition in seals. Capelin can be ranked similar to polar cod as a seal food resource. There is competition for krill as a food resource for both fish (such as cod) and seals. With increasingly more temperate conditions in the Barents Sea there is a likely less requirement for lipid accumulation as energy storage (*i.e.* thicker blubber). However, the current pup production is now half what it was earlier in 2003.

### **Icelandic Minke Whale Research Program**

The findings of the Icelandic programme were presented to a specialist panel at a dedicated IWC workshop in February 2013. At the workshop, 30 scientific papers from the research programme were presented to the specialist panel. The papers covered the multiple objectives of the study, including feeding ecology (stomach contents, stable isotope ratios, fatty acid profiles), energetics, multi-species modelling, biological parameters, satellite tagging, distribution and abundance, genetics, pollution, parasites and pathology. At the 2013 SC meeting, only a summary of these findings from the Icelandic Minke Whale Research Program was presented. Reported diet changes had been linked to environmental conditions. The modelling part of this project is ongoing and has now become an integral part of a MAREFRAME programme "Co-creating Ecosystem-based Fisheries Management Solutions" in the EU – a study initiated by NAMMCO but now including only Iceland. Mátís in Iceland is the coordinator for this project.

### **Contaminants**

Greenland asked Iceland and Norway about contaminant levels in killer whales and Norway reported on very high levels.

The Faroe Islands reported that research into contaminants in pilot whales continues and is an ongoing work.

## **10. EXTERNAL RELATIONS**

The General Secretary (Christina Lockyer) introduced (NAMMCO/22/12) and presented summaries of observer reports from attendance at meetings of the 65<sup>th</sup> IWC SC meeting (2013), the ASCOBANS 7<sup>th</sup> Meeting of Parties (2012), the ASCOBANS 20<sup>th</sup> Advisory Committee meeting (2013), the NEAFC 32<sup>nd</sup> annual meeting (2013), the 3<sup>rd</sup> Meeting of the Arctic Council Experts Group on Arctic Ecosystem-Based Management (2012), the 10<sup>th</sup> Meeting of the South East Atlantic Fisheries Organisation (SEAFO), and the Annual Meeting of the Norwegian Small Whalers Union (2013). Regrettably, observer reports had not been received from meetings of the Arctic Council SAO (in 2013), 34<sup>th</sup> and 35<sup>th</sup> Annual meetings of

NAFO, the 31<sup>st</sup> Annual Meeting of NEAFC (2012), nor the 30<sup>th</sup> Annual meeting of NASCO. The Secretariat informed that NAMMCO member countries had traditionally agreed in advance concerning responsibilities for sharing such tasks, and that reminders had been circulated. Council regretted the breakdown in the period since NAMMCO 21, and urged members to send reports to the Secretariat. The Secretariat tries to cover some meetings, but is unable to cover all meetings due to staff and budgetary limitations.

The General Secretary highlighted certain points, including the informing of the plans for T-NASS in 2015 at ASCOBANS, and being urged to liaise with coordinators of SCANS III survey (scheduled for 2016). Despite the two surveys occurring in different years, experimental surveys would be implemented in SCANS III in 2015 and there could be benefits in exchanging methods and techniques.

Greenland enquired if there were any members who could report on the outcome of the Arctic Council EBM expert group work, and urged them to inform when there was new activity.

The General Secretary informed the Council that in 2014, staff would observe at the IWC SC meeting in Slovenia; also the 66<sup>th</sup> IWC Commission meeting in Slovenia. The Secretariat would also attend the 31<sup>st</sup> COFI meeting in Rome alongside the biennial FAO RSN (Regional Secretariats' Network) meeting. Although attendance at Arctic Council meetings and associated working groups had not happened in 2013, it was hoped to maintain links with the organisation and participate when staff were available and also travel costs would be minimal.

The General Secretary also informed that she would be participating in the IWC Workshop on Arctic Impacts (6-7 March 2014) in Anchorage, and would be contributing a poster – see also under item 11.

## **10.1 Cooperation with international organisations**

### **ICES**

The Council registered disappointment at the non-participation of ICES as observer at NAMMCO 22. Participation had occurred in 2011 and 2012, and links and communication had been strengthened since the signing of the Letter of Agreement between NAMMCO and ICES for cooperation on scientific matters. In relation to requests for more formal links with ICES on matters of the seal working groups (see item 3.1 above and also in NAMMCO/22/7; Section 2.2), the Secretariat agreed to contact ICES and open a dialogue.

### **IWC**

The observer for Denmark, Gitte Hundahl, informed NAMMCO members on the current state of affairs with regard to the Kingdom of Denmark's relations with the IWC, including attempts to solve the issue of catch limits for Greenland's aboriginal subsistence whaling, where international consultations are being held in order to seek a solution at the IWC Commissioners' meeting in 2014 in Slovenia. Greenland had decided to continue whaling to meet the needs of the people and avoid unregulated whaling. As one of the original 15 countries that were signatories to the Convention, Denmark wished to recognise its obligation to the IWC but would have to withdraw from the IWC if no solution could be found acceptable to both Greenland and the IWC-Commission. It was noted that this situation also could have important implications for the Faroe Islands and for other aboriginal subsistence whaling communities such as Chukotka, and Russia present at the meeting.

## **10.2 Other business**

No comments.

## **11. INFORMATION**

The General Secretary presented NAMMCO/22/13. She drew attention to two important scientific conferences that had taken place in 2013 – the Society for Marine Mammalogy's 20<sup>th</sup> Biennial Conference, Dunedin, New Zealand, 9-13 November 2013, attended by the Scientific Secretary, and the 3<sup>rd</sup> World Congress of Marine Biotechnology, Hangzhou, China, 23-25 September 2013, attended by the General Secretary. The first was attended by about 1,200 scientists and researchers worldwide, and was an ideal venue for the new staff member to become known and develop her network. A display of

## Report of the Council

the NAMMCO Scientific Publications series was set up and some issues sold. In addition, 4 books were donated as prizes to students, as has been the case in several previous conferences. Attendance at the second conference was partly supported by the organizers. A talk was presented to an audience mainly from Asia, most of which rarely have the opportunity to meet western scientists. The core presenters were invited from countries worldwide and on the basis of their field of expertise. This was a conference with broad perspectives, and was exciting to learn much about related areas of research that usually are difficult to follow. Some good contacts were made with Chinese researchers requesting advice and assistance in the areas for developing stranding schemes and by-catch monitoring for marine mammals, as well as reviewing on scientific journals.

In addition, three other events were reported for information. These included: Healthy Oceans – Productive Ecosystems: A European conference for the marine environment, Charlemagne Building, EC Brussels, 3-4 March 2014; the IWC Workshop on Impacts of Increased Marine Activities on Cetaceans in the Arctic, Anchorage, USA, 6-7 March 2014 (see note above under item 10), and the Global Oceans Action Summit for Food Security and Blue Growth, The Hague, Netherlands, 22 - 25 April 2014.

### **Comments:**

Regarding the *IWC workshop in Anchorage*, KNAPK had been invited to make a presentation at this meeting but was unable to attend because of other commitments. The Greenland institute for Natural Resources would attend and be presenting some posters.

Iceland commented that NAMMCO should accept the invitation for the *Global Oceans Action Summit for Food Security and Blue Growth*, especially if there were opportunities to make a presentation or intervention.

Greenland had also received an invitation but will not attend because the Minister is not available.

Norway noted that as this was a summit, representation was by government and that likely there would be limited chances to speak. However Norway supported representation on behalf of or by NAMMCO. The Faroe Islands also agreed to the supporting an observer at the Summit in the Netherlands.

Thus Council **approved** attendance by the Secretariat at this meeting. The Secretariat responded that it would contact the organisers and enquire about the chance to make an intervention, and also try to arrange representation at the Summit.

### **11.1 Scientific Publications**

The Scientific Secretary (Jill Prewitt) reported about the online publication that has been established in collaboration with the University of Tromsø's (UIT) Septentrio Academic Publishing. In order to establish this cooperation with the UIT, NAMMCO established an Editorial Board consisting of one UIT professor (Lars Folkow), one Scientific Committee member (Tore Haug), and the Scientific Secretary (Jill Prewitt). The journal website (<http://septentrio.uit.no/index.php/NAMMCOSP/index>) published the first paper on 21 August 2013, and as of 26 February 2014, has had 1,900 visitors from 66 countries. The *Walrus of the North Atlantic* volume 9 has now 11 papers online and a further 3 almost ready to go. The volume 10 on *Age estimation of marine mammals with a focus on monodontids* has 2 papers online so far.

The walrus volume is scheduled to appear in hard back format, but the monodontid volume will only be online. The decision now is not to publish hard volumes after the walrus issue.

In addition, the earlier volumes 6, 7 and 8 (harbour porpoise, grey and harbour seals) have been placed online.

The Secretariat (Scientific Secretary) was **commended** for the work by all members.

### **11.2 Progress on Stock Status list – website**

The General Secretary reported that the second phase contract with GDNatur, Denmark, was nearing completion. In fact an extension had been granted to the end of April 2014 to finalise the work. Species completed now include Fin, Minke and Beluga whales. A general introduction and glossary were also near completion. The species for which a comprehensive account is being prepared are pilot whale, narwhal, ringed seal and walrus. Remaining species will only have a brief general account. The information is being compiled on a specially designed Google webpage. The intention is to link this site to the NAMMCO website in due course. However, this would not happen until the current website is upgraded.

### **11.3 Upgrading of the NAMMCO website**

The General Secretary reported that negotiations were ongoing for the complete upgrading of the NAMMCO website. The existing site was now outdated in terms of software compatibility (notably Microsoft new versions), and could not offer search engine facilities nor possibilities for making meeting documents accessible for downloading. These matters were frustrating for all concerned. New versions of the webpage programme were available and were much more user friendly. This would be a priority for the Secretariat, and the upgrading would commence as soon as feasible after the purchase of new computers and software budgeted for in 2014.

## **12. ANY OTHER BUSINESS**

Japan introduced information on a meeting on 9-10 April 2014 in Tokyo, on sustainable uses of marine resources including marine mammals. As the background to this event, Japan recalled that in 2012, the IWC failed to establish Greenlandic subsistence whaling catch quotas based on the Danish recommendation. The negative influences in the IWC resulted in some countries changing their position relating to utilisation of sustainable resources. Japan concluded by inviting NAMMCO members and Russia to participate at this meeting.

Greenland indicated that it wanted to discuss the capacity building of NAMMCO and its Secretariat over the next 20 years.

## **13. CLOSING ARRANGEMENTS**

### **Press Release**

The General Secretary presented the draft press release prepared by the drafting group 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 6, and was released to Council, meeting participants, and the website, and distributed to range state governments, national and the international media, and international organisations on the 28 February 2014.

### **13.1 Next meeting**

The next meeting will be hosted by Iceland at a venue yet to be determined. The date will likely be in the period January-February 2015.

The Chair of Council thanked all delegates and participants for a productive meeting, and declared the meeting closed.

## **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

### **2. FINANCE AND ADMINISTRATION**

- 2.1 Report of the Finance and Administration Committee
- 2.2 Audited accounts 2012 and 2013
- 2.3 Draft Budget 2014 and Forecast Budget 2015
- 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 2014-2015
- 3.4 Other business

### **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

### **7. HUNTING METHODS**

- 7.1 Report of the Committee on Hunting Methods
- 7.2 Manual on Hunting of Marine Mammals
- 7.3 Other business

### **8. THE JOINT NAMMCO CONTROL SCHEME**

- 8.1 Report of the Committee on Inspection and Observation
- 8.2 Other business

### **9. ENVIRONMENTAL QUESTIONS**

### **10. EXTERNAL RELATIONS**

- 10.1 Cooperation with international organisations
- 10.2 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

13. CLOSING ARRANGEMENTS

- 13.1 Next meeting.

**LIST OF DOCUMENTS**

|                 |   |
|-----------------|---|
| NAMMCO/22/1     | List of Participants                                    |
| NAMMCO/22/2     | Agenda  |
| NAMMCO/22/3     | List of Documents                                       |
| NAMMCO/22/4     | Report of the Finance and Administration Committee      |
| NAMMCO/22/4.1   | Audited accounts 2012 and 2013                          |
| NAMMCO/22/4.2   | Budget 2014 and forecast budget 2015                    |
| NAMMCO/22/5     | Report of the Scientific Committee                      |
| NAMMCO/22/6     | T-NASS 2015 Proposal                                    |
| NAMMCO/22/7     | Report of the Management Committee for Cetaceans        |
| NAMMCO/22/8     | Report of the Management Committee for Seals and Walrus |
| NAMMCO/22/9     | Report of the Committee on Hunting Methods              |
| NAMMCO/22/10    | Manual on Hunting of Marine Mammals                     |
| NAMMCO/22/10A   | Manual on Hunting with whaling cannon and grenades      |
| NAMMCO/22/10B   | Manual on Hunting for pilot whales                      |
| NAMMCO/22/11    | Report of the Committee on Inspection and Observation   |
| NAMMCO/22/12    | External Relations                                      |
| NAMMCO/22/13    | Information   |
| NAMMCO/22/14    | Observation scheme 2013 – Report from the Secretariat   |
| NAMMCO/22/NPR-F | National Progress Report Faroe Islands                  |
| NAMMCO/22/NPR-G | National Progress Report Greenland                      |
| NAMMCO/22/NPR-I | National Progress Report Iceland                        |
| NAMMCO/22/NPR-N | National Progress Report Norway                         |
| NAMMCO/22/NPR-C | National Progress Report Canada                         |
| NAMMCO/22/NPR-J | National Progress Report Japan - compilation            |
| NAMMCO/22/NPR-R | National Progress Report Russian Federation             |



## **OPENING STATEMENTS BY MEMBER DELEGATIONS AND OBSERVER GOVERNMENTS**

### **FAROE ISLANDS – OPENING STATEMENT**

Madam Chair, Delegates, Observers, dear Friends,

Going on from the newly celebrated 20th anniversary of NAMMCO cooperation we look forward to embarking on another 20 years ahead of productive work. Our unique cooperation is, we feel, soundly based, and we are confident that we have the right basis for engaging the challenges ahead.

For the Faroe Islands, the tradition of NAMMCO cooperation is of great significance to our nation. We have a long, unbroken history of utilisation of marine mammals. Through our membership in NAMMCO we are a party to an internationally recognised organisation for cooperation on the management and conservation of marine mammals. This means a lot to us.

Right now 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.

The Faroe Islands warmly welcome the excellent work of the Hunting Committee. The updated and very useful information on hunting practices in the new Hunting Manual is a good example of science working constructively with hunters. Already, the Faroes are in the process of implementing the advice produced in the Hunting Manual.

As mentioned before, we look ahead to developing NAMMCO cooperation in the years to come, too. Our track history so far has, in our opinion, been productive and impressive. But we must not rest on our laurels, lest we become complacent. We must be sure to build on the platform we have laid so far.

And finally, we must always remember to pursue and engage the best and most updated knowledge possible. That is the recipe for sustainable management and harvesting of our mammal resources in the North Atlantic. This has been the trademark of NAMMCO work, and the work presented to us here today also bears testimony to the fact that this is a positive ongoing process. The Faroe Islands look forward to be an active part of that good and productive cooperation in times to come.

### **GREENLAND – OPENING STATEMENT**

Madam Chair, Ladies and Gentlemen,

#### **Sustainable and responsible management of Whaling and Sealing:**

Whaling and sealing in Greenland, like in some countries in the North Atlantic are economically, culturally and socio-economically important activities. They are conducted in accordance with a sustainable and precautionary principle under appropriate management measures and with the use of effective killing techniques and methods. This is a fact neglected from many countries.

For Greenland, the categorization of whaling and sealing to certain boxes like “commercial whaling” or “aboriginal subsistence whaling” or “Inuit sealing” are not favourable options. We do not see those activities differently than commercial use of fish resources. The most important point is that any type of whaling and sealing are conducted in a sustainable and responsible way.

It is ten years ago Greenland introduced quota system on narwhal and beluga and 8 years ago with the introduction of walrus quota. Today, we are proud to inform NAMMCO partners and others that the

## Report of the Council

decisions and increased knowledge have resulted in increasing stocks for those species, which allow us to make increase in the current quotas following scientific advice. This is not only good words for our hunters and other citizens to hear in Greenland, but a message to the world that we are responsible and that, we are able to take care of our own natural resources through the relevant regional management body like NAMMCO.

### **Best practise and instruction manuals on the hunt of marine mammals are focal points to NAMMCO**

Greenland is proud to be part of the constructive work and publication of the instruction manual on the hunt of baleen whales in NAMMCO member countries. For the safety of the crews and to obtain the most effective gears and methods in the hunt, it is important that hunters and stake holders are updated with instruction manuals. For Greenland best practise and the safety of the hunters on the spot in all kind of killing animals is the key issue.

### **Capacity building of NAMMCO Scientific Committee**

Greenland has actively participated in the capacity building when it comes to the issue of the Committee on Hunting Methods, the Committee on Inspection and Observation and reconstruction of the Management Committees in collaboration with the other member countries since 1992. The time has come to look into the possibilities in capacity building of the NAMMCO Scientific Committee and its working groups. Not because Greenland is displeased with Scientific Committee, but because the time has come to do it. The aim is to introduce the work and the use of management procedures in the decision making process within the NAMMCO. Only, in that way, NAMMCO member countries can set limits between sustainability, scientific advice and politics. Greenland is looking forward to work with you on the T-NASS.

A stronger NAMMCO as a regional management body requires stronger Scientific Committee, which can create management procedures for marine mammals.

## **ICELAND – OPENING STATEMENT**

Madam Chair, Delegates, Observers and dear Friends.

It is with great pleasure that the Icelandic delegation once again attends the Annual Meeting of NAMMCO here in Oslo.

First of all we would like to welcome NAMMCO's new Scientific Secretary Jill Prewitt to her first Annual Meeting and express our gratitude to the Secretariat that has done great work in preparing this meeting and providing us with excellent meeting facilities.

As everyone here knows, sustainable utilisation of living marine resources is the key word for all of the NAMMCO member countries. The main basis for our economic welfare is utilising the living resources of the sea, and we see no logical reason for treating marine mammals differently than other living resources of the sea. The sustainability of all living marine resources is therefore essential for the long-term prosperity of our countries.

For this reason international cooperation in this field is of great importance to us all and we need to work together for the sustainable utilisation, conservation and study of these resources. NAMMCO has made valuable contributions to the conservation and sustainable management of marine mammals, not least through the work of the Scientific Committee. Therefore the objective and science-based approach used in NAMMCO is of utmost importance.

Last week Iceland declared strong support for Canada and Norway in submitting its appeal as a third party to the WTO Panel's Report from last year in the long-standing dispute concerning the EU's measures prohibiting the importation and marketing of seal products. In Iceland's third-party submission it subscribes to the legal and factual arguments put forward both by Canada and Norway in their appeal.

In the beginning of February, Iceland was certified under the Pelly Amendment by the US Secretary of Interior. The US authorities base their certification on the assertion that Iceland's international trade in whale products diminishes the effectiveness of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) as Iceland's reservations to the CITES Appendices listings of fin and minke whales lack an adequate scientific basis. As all of NAMMCO countries are aware of, from the work of the Scientific Committee, the fin whale stock around Iceland is abundant and can sustain the catch levels issued by Iceland. The favourable status of North Atlantic fin whales is also reflected in the recent regional IUCN assessment for Europe where the species is not considered threatened. The certification of Iceland by the US has therefore no legal or scientific basis.

The series of North Atlantic Sightings Surveys has been of paramount importance for the sustainable management cetacean stocks in the NAMMCO area. The Scientific Committee of NAMMCO has fulfilled an important role in coordinating these surveys since 1995. 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 initiative taken by the Scientific Committee in developing an ambitious research programme concerning marine mammal fisheries interactions. This initiative has now led to a large EU funded research program on multi-species/ecosystem management on marine living resources that had its kick-off meeting in Reykjavik in two weeks ago. Iceland urges the Scientific Committee to continue its good work towards strengthening the basis for future multi-species management in the NAMMCO area.

Thank you.

#### **NORWAY – OPENING STATEMENT**

Chair, Delegates, Observers and Guests - Dear friends,

It is a pleasure to see the NAMMCO Council gathered here in Oslo, Norway.

NAMMCO has strengthened its position as a well-functioning management body that generates high quality advice to its members, observers and other interested parties. The management of marine mammals represents challenges of various kinds. In NAMMCO we meet these with a solid combination of the best available science and the knowhow of the hunter. This knowledge base puts NAMMCO in a unique position. It enables us to act with confidence. It also inspires confidence in the outside world in the knowledge-based management that we adhere to. 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 knowledge.

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 to commend the Committee on hunting methods and in particular the work and dedication that the committee has put into the Manual for the instruction on the maintenance and use of weaponry and equipment deployed in hunting of baleen whales. The relevance and quality of the committee's work is reflected in the fact that all whaling nations now use NAMMCO for guidance in this field.

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 you all a fruitful meeting.

Thank you.

#### **CANADA – OPENING STATEMENT**

## Report of the Council

Madame Chairman, Distinguished delegates, fellow observers,

Canada is pleased to participate as an Observer in this 22<sup>nd</sup> meeting of the NAMMCO Council. We would like to take this opportunity to thank our Norwegian colleagues for hosting this meeting, and we look forward to productive discussions over the next three days.

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. Canada is also looking forward to continued bilateral engagement with NAMMCO members within other organizations, such as CITES and the JCNB.

We look forward to exploring further opportunities for collaboration during this meeting and are looking forward to positive discussions over the next few days. Thank you for having us here at the meeting.

### **JAPAN – OPENING STATEMENT**

We would like to express our appreciation to the NAMMCO for the invitation to the Twenty Second meeting of the Council. We would also like to thank the NAMMCO Secretariat for the meeting arrangements and the Government of Norway for its warm hospitality.

At the last meeting of the Council which marked its 20<sup>th</sup> anniversary, we applauded the achievements of NAMMCO as an organization for international cooperation for sustainable utilization of marine living-resources based on science, in conformity with international law and with respect for the needs of coastal communities and indigenous people. We believe that the NAMMCO will continue to play an important role for conservation and management of marine living resources for the purpose of its sustainable utilization.

Looking at the current International Whaling Commission (IWC), it is extremely regrettable that the IWC continues to fail to function properly to fulfill the purpose of International Convention for the Regulation of Whaling (ICRW) and fail to play its important role as a regime that provides “for the proper conservation of whale stocks and thus make possible the orderly development of the whaling industry” as stated in the preamble of ICRW. At its 64th Annual Meeting in 2012, the aboriginal subsistence whaling catch limits proposed by Denmark on behalf of Greenland were rejected despite the fact that its sustainability was supported by consensus at the IWC Scientific Committee. The people of Greenland have our deep sympathy, as Japan has been requesting our coastal small type whaling quota for similar reasons to no avail.

Nevertheless, our belief in and stance on the sustainable use of living marine resources have not been shaken at all. It is in this spirit that Japan has been conducting scientific whale research programs to provide the IWC with scientific data necessary for conservation and management based on science, in such a manner that the research program will not cause any harm to stocks in full application of the precautionary approach. While this Council meeting is taking place, a scientific review of the JARPA II program is being conducted by a panel of independent experts under the IWC’s guidelines in Tokyo. We are very much pleased to have the opportunity for a serious and constructive scientific review of the program in which Japan has invested a great deal of resources and efforts. We also wish to express our appreciation to you and your experts who have contributed to help us our research program.

Finally, I would like to reaffirm our commitment to work closely with our partners supporting the idea of sustainable use of marine living-resources. We believe that we have to make our best efforts to prepare for the next meeting of IWC. For that purpose, we will hold a meeting in Tokyo on the Sustainable Use of Marine Living Resources including Cetaceans by inviting representatives of countries and organizations which share the concept of the sustainable use of marine living-resources. We look forward to your participation and seeing you soon in Tokyo.

Thank you.

**AUDITED ACCOUNTS FOR 2013 and 2012****PROFIT AND LOSS ACCOUNT (NOK )**

|                              | <b>2013</b>      | <b>2012</b>      |
|------------------------------|------------------|------------------|
| <b>Income</b>                |                  |                  |
| Contributions                | 4 208 161        | 3 605 303        |
| Interest received            | 42 299           | 48 987           |
| Book sale                    | 4 150            | 12 187           |
| Employers Tax                | 245 111          | 255 541          |
| Employees                    | 702 879          | 926 305          |
| <b>Total Income</b>          | <b>5 202 600</b> | <b>4 848 323</b> |
| <b>Expenditure</b>           |                  |                  |
| Secretariat costs            | 4 276 234        | 4 481 218        |
| Travel and meetings          | 245 294          | 374 339          |
| Observation Scheme           | 309 547          | 64 252           |
| Scientific Committee         | 20 022           | 221 638          |
| Information                  | 159 599          | 127 450          |
| <b>Total operating costs</b> | <b>5 010 696</b> | <b>5 268 897</b> |
| <b>Operating result</b>      | <b>191 904</b>   | <b>-420 574</b>  |

**BALANCE SHEET**

|  |                |                  |
|--|----------------|------------------|
| <b>Current assets</b>                  |                |                  |
| Bank deposits                          | 226 074        | 2 356 248        |
| Outstanding claims                     | 226 074        | 306 247          |
| <b>Total assets</b>                    | <b>513 394</b> | <b>2 662 495</b> |
| <b>Current liabilities</b>             |                |                  |
| Employers tax                          | 96 105         | 87 377           |
| Creditors                              | 13 494         | 67 324           |
| Other                                  | 135 887        | 2 431 789        |
| <b>Total liabilities</b>               | <b>245 486</b> | <b>580 437</b>   |
| <b>EQUITY</b>                          |                |                  |
| Distributable equity (General Reserve) | 267 908        | 76 004           |
| <b>Total equity</b>                    | <b>267 908</b> | <b>76 004</b>    |
| <b>Total liabilities and equity</b>    | <b>513 394</b> | <b>2 662 494</b> |

**Rules of Procedure  
FOR THE COMMITTEE ON INSPECTION AND OBSERVATION**

**1 Terms of Reference**

- 1.1 The Committee shall, upon request from the Council, individual member countries or the Secretariat, provide advice on the Joint NAMMCO Control Scheme for the hunting of marine mammals.
- 1.2 The Committee shall function as a standing review body to monitor the implementation of the Observation Scheme under the Joint NAMMCO Control Scheme for the hunting of marine mammals and provide recommendations for improvements.
- 1.3 Members of the Committee may raise specific questions for discussion during meetings of the Committee. The Committee may make proposals to the Council for specific tasks to undertake within its terms of reference.
- 1.4 Non-member governments with observer status in NAMMCO may request advice from the Committee through the Council.

**2 Membership**

- 2.1 Each NAMMCO member country shall be represented with up to two Committee members.
- 2.2 The Committee shall elect from among its members a Chair and a Vice-Chair, who shall each serve for two years, after which time they may be re-elected.
- 2.3 The Committee may also seek outside expertise when the Committee considers this to be necessary and appropriate.

**3 Observers**

- 3.1 Attendance of observers shall not be permitted at the meetings of the Committee unless otherwise decided by the majority of the Committee and approved by the Council.

**4 Meetings**

- 4.1 The Committee shall meet once a year, preferably prior to the annual meeting of the Council, unless otherwise decided by the Council. Additional meetings may be held when judged necessary by the Committee and approved by the Chair of the Council.
- 4.2 A provisional agenda for the Committee shall be compiled by the Chair and distributed to Committee members no later than 30 days prior to the meeting in question. Comments or suggestions for revision of the provisional agenda shall reach the Chair no less than 10 days prior to that meeting.
- 4.3 The Chair shall, in consultation with other members of the Committee and the Secretariat of NAMMCO, seek to ensure that key documentation of relevance to the provisional agenda is available at the beginning of each meeting.

**5 Report**

- 5.1 Main recommendations and conclusions shall be formulated by the Secretariat and the Chair for consideration before the end of the Committee meeting. A final report of each meeting shall be prepared by the Secretariat for approval by the Committee, reflecting the main deliberations

and recommendations to Council. The report shall be transmitted to all members of the Council as soon as possible after the meeting.

- 5.2 The report of the Committee shall be made available by the Secretariat to anyone who so wishes, according to guidelines approved by the Council.

**6 Amendment of Rules**

- 6.1 Proposals for amendment of these Rules of Procedure shall reach the Chair of the Council not less than 60 days prior to the Council meeting at which the matter is to be discussed. The Chair of the Council shall transmit these proposals through the Secretariat to the Members of the Council not less than 30 days prior to that meeting.

**PRESS RELEASE**

28 February 2014

**ACTIVITIES SINCE THE 20<sup>TH</sup> ANNIVERSARY, 2012**

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 22<sup>nd</sup> Council meeting from 25 – 27 February 2014, in Oslo, Norway. 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 are represented by observers at meetings of NAMMCO, as well as other international governmental organizations within the fields of fisheries and whaling.

Key events and conclusions from the meeting included the following:

- **Marine Mammals in the context of Food Security**

At a ministerial meeting in 2012, NAMMCO agreed to look at the possibilities of organising an international event where the use of marine mammal products will be examined in the context of global food security. Marine mammals are an under-utilised food resource that undoubtedly is one of the most ecological on the planet. A planning group has now been charged with preparing the event in 2015.

- **Manuals on whale hunting**

NAMMCO has completed two authoritative manuals: one dealing with large baleen whaling and the use of whaling cannon and the penthrith grenade, and a second dealing specifically with the use of the spinal lance and hook in the pilot whale hunt. These are the first comprehensive manuals for hunters that detail use, maintenance, weaponry and ballistics information with a focus on safety. An English language version of each will be accessible shortly on [www.nammco.no](http://www.nammco.no), and the manuals will be available in native languages as required for the hunting communities.

- **Online free-access NAMMCO Scientific Publications**

Online publication has been established in collaboration with the University of Tromsø's (UIT) Septentrio Academic Publishing. The journal website (<http://septentrio.uit.no/index.php/NAMMCOSP/index>) published the first paper in August 2013, and as of February 2014, has had 1,900 visitors from 66 countries.

- **Inspection and Observation**

NAMMCO has 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 effort of the control scheme for the 2014 season is the Norwegian seal hunt. A training course for observers appointed under the NAMMCO Joint Control Scheme for the Hunting of Marine Mammals took place in March 2013 with participation of 14 candidates.

- **Counting whales**

The series of North Atlantic Sightings Surveys has been the Flag ship of NAMMCO and is of vital importance for the sustainable management of cetacean stocks in the NAMMCO area. Member nations are planning the sixth comprehensive trans-North Atlantic cetacean Sightings Survey (T-NASS). T-NASS will be coordinated with other national surveys in the area in the summer of 2015.

- **Improving assessments**



Tagging of free ranging animals plays an increasing role in management decisions of marine mammals. Examples include a harbour porpoise tagged off West Greenland that repeatedly crossed the southern Davis Strait to Canada while another moved north to the Disko Bay, south to East Greenland and south east into deep waters in the central North Atlantic where it wintered. Pilot whales tagged off the Faroe Islands were tracked close to the Azores. Hunter-gathered biological samples and data were also important in the advice for larger quotas of walrus in Greenland.

- **Sea ice retreat and seals**

Harp seals are major top predators in the Barents Sea/White Sea. In June they disperse to feed, following the receding ice edge and moving northwards, thus replenishing their energy reserves. It has been observed that body condition in the most recent decade is reduced compared to previous years. Concurrently with this, the ice free area of the northern part of the Barents Sea has increased during summer, and some fish species, such as cod, have extended their range northwards. Competition between harp seals and other predators such as cod for shared resources such as krill, may have contributed to such negative effects on condition. Longer migration routes to the ice edge with increased energy expenditure between the breeding/moulting areas and feeding areas may certainly also have contributed to the reduced recent harp seal body condition.

- **EU trade ban on seal products – WTO case**

NAMMCO reiterates that the EU seal ban regulation ignores and undermines the internationally recognized principles on which conservation and management of marine resources in the North Atlantic are firmly based. It has serious and detrimental consequences for the economies of the many communities dependent on abundant seal stocks across the North Atlantic, including Inuit communities. This issue involves important principles, such as the right to sustainably harvest living marine resources and to sell products derived from hunting and fishing.

A WTO panel concluded that EUs seal regulation violates WTO rules concerning non-discrimination. However, the panel did not conclude that the regulation is more trade restrictive than necessary. Norway, Canada and the EU have appealed the WTO Panels findings, and Iceland has made a submission as a third party. A decision is expected in April/May 2014.

- **US certification of Iceland**

Iceland informed that it had recently been certified under the Pelly Amendment by the US Secretary of Interior. The US authorities base their certification on the assertion that Iceland's international trade in whale products diminishes the effectiveness of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) as Iceland's reservations to the CITES Appendices listings of fin and minke whales allegedly lack an adequate scientific basis. To the contrary, the fin and minke whale stocks around Iceland are abundant and the quotas are based on scientific advice from NAMMCO. The US certification has therefore no scientific basis.

NAMMCO members supported the view that this certification entirely contradicts the internationally recognized principles upon which NAMMCO is based, in particular the principle of sustainable utilization of all living marine resources.



## 1.2

### REPORT OF THE COMMITTEE ON HUNTING METHODS

This document contains the following:

Report of the meetings of the Committee on Hunting Methods held 22 – 23 January 2013 and 25 -26 November 2013 including

- Appendix 1: List of laws and regulations in NAMMCO member countries
- Appendix 2: List of references on hunting methods

#### REPORT OF THE COMMITTEE ON HUNTING METHODS - 1

The Committee on Hunting Methods met on 22 and 23 January 2013 at the Greenlandic representation in Copenhagen. Present were Egil Ole Øen, chair, Kathrine Ryeng and Hild Ynnesdal (Norway), Jústines Olsen, (Faroe Islands), Kristjan Loftsson and Eypór Björnsson (Iceland), 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, Egil Ole Øen, welcomed the Committee members to the meeting. The draft agenda was adopted and Charlotte Winsnes acted as rapporteur.

#### 2. UPDATES ON HUNTING METHODS IN MEMBER COUNTRIES

The lists of laws and regulations in member countries (NAMMCO/HM-January 2013-3) and references on hunting methods (NAMMCO/HM-January 2013-2) were updated (see Appendices 1 and 2 of this report).

##### Faroe Islands

Olsen (Faroe Islands) informed the meeting that the announced revision to the regulation on hunting methods was not yet in place. Experience from the last drives is that the spinal lance is widely used but in lack of a standardised version hunters make their own lance.

The Committee once again commended Justines Olsen for his work on the new lance and reiterated its recommendation that the standardised spinal lance with the design as presented and evaluated in the NAMMCO Expert Group meeting on small cetaceans held November 2011, should be the lance made mandatory for use in the Faroe Islands. Furthermore, training of hunters using the spinal lance should be made mandatory.

##### Greenland

Levermann (Greenland) informed the meeting that a revision of the Executive Order regulating the hunt on large whales is expected to be finalized in February 2013. The changes entail among other things regulation of hunting time and number as well as length of the vessels used for the hunt of humpback whales, requirement to inform the local wildlife officer about the whaling plans and times, and specification of rules for the sale of the products to the consumer.

Furthermore work has commenced on an update on the Greenland Home Rule Act on hunting from 1999 with later amendments. This will also require a review of all executive orders affected by this act.

Greenland submitted a revised White paper on Management and Utilization of Large Whales in Greenland (IWC/64/ASW/7) with a Note on the Greenlandic Needs Statement (IWC/64/ASW/8).

Furthermore data to the IWC Working Group on Whale Killing Methods and Associated Welfare Issues (IWC Document IWC/64/WKM&AWI7) and a note on the Progress on Conversion Factors for the Greenlandic Hunt (IWC/64/ASW/710) was submitted at last year's 64'th annual meeting in the International Whaling Commission.

Catch statistics from 2012 show that 10 humpback whales were taken and no bowhead whale hunting taken place. The time to death varies from instantaneous up to 20 – 25 minutes. The quota loft on minke whale and fin whale was not reached. There is a system in place in Greenland that makes it possible to follow the grenade from the sale to when it is used. A higher degree of control effort will be put on this possibility in 2013.

The Committee took note of the information and reiterated the recommendation that Greenland and Iceland focus on analyses of time to death data and also how collection of data can be standardized.

### **Iceland**

*Björnsson (Iceland) reported that there had been no new regulations for the hunting of fin and minke whales the last year. In 2012 49 minke whales were caught and three whales were reported as struck and lost. No fin whale hunting had taken place in 2012.*

### **Norway**

Ynnesdal (Norway) reported that there had been no new regulations with respect to hunting of whales or seals the last year. In line with recommendations from the NAMMCO Expert Group on Large whales, time to death data had been collected in 2011 and 2012. The data are presently being analysed but preliminary results indicate that around 80% of the animals caught are killed instantaneous, thus confirming the findings from the research programme executed in 2000-2002.

The method of data collecting is well described and should be easily adaptable for other countries i.e. Iceland and Greenland. The processing and analysing of the data do however require specialised expertise.

In 2012 465 minke whales were caught including seven stuck and lost with a quota of 1286. 20 vessels were approved with 18 active vessels during the season. The hunting period is from 1/4-1/8, in total 5 months.

Initiated by the Norwegian authorities and mindful of the last accident in 2012, the Minke Whalers Association and Vessel owners are planning a seminar on safety and maintenance of harpoon canons used in Norway in Sandefjord prior to the next whaling season. It was noted that Greenland has in place exceptionally well-functioning routines to ensure the safety when handling canons.

The Committee took note of the information presented by Norway.

In response to a suggestion from Greenland the Committee decided to include the following items as points of information for future meetings under this agenda item:

- Quotas
- Number of active hunting boats
- Catch numbers including struck and lost
- Hunting period
- Strandings
- Irregularities
- Others

### **3. HANDBOOK/USER MANUAL**

Presented under this agenda item were documents:

- NAMMCO/HM-January 2013-4 draft of manual on penthrate grenade
- NAMMCO/HM-January 2013-5 draft list of content pilot whale hunt Faroe Islands
- As background documentation:
- The original list of content penthrate grenade agreed by the Committee
- The NORA application for funding

Øen presented the draft manual on the penthrate grenade developed in cooperation by him and Winsnes at the Secretariat. The Committee agreed to the general content and structure of the manual with the addition of including a chapter on back-up weapons i.e. rifles and ammunition, and a more thorough foreword on the purpose of the manual and who the expected reader will be. It was also agreed that the Committee members would sign the foreword.

The Committee decided to extend the manual to also include country specific appendices listing additional equipment required onboard a whaling boat such as knives, boyos, pulling power for winches etc. Greenland and Island agreed to submit these lists to the Secretariat for inclusion in the manual.

Considerable time was given to go through the draft manual page by page editing text and deciding on illustrations. The use of the penthrate grenade in Island and Greenland, especially with respect to large whales, differs somewhat from the minke whale hunt in Norway. Island and Greenland are responsible for identifying the necessary amendments for these hunts and communicating this to the Secretariat.

Øen and the Secretariat were tasked with preparing a new final draft for presentation to the Committee based on the changes and comments deriving from the meeting.

The Committee discussed the presented draft content for the part of the manual describing the pilot whale hunt in the Faroe Islands developed by Olsen. It was agreed that Olsen in cooperation with the Secretariat would prepare a draft for the consideration of the Committee by June 2012. Levermann was tasked with preparing a draft on the collective rifle hunt and the rifle- and netting hunt for small cetaceans in Greenland as soon as possible.

Illustrations both drawings and photos were discussed and it was agreed that Levermann would be responsible for making photos of the canon and grenade used in Greenland including essential parts described in the text. Furthermore Greenland will be responsible for illustrations relating to the rifle and netting hunts. Olsen will be responsible for photos pertaining to the pilot whale hunt and Øen and the Secretariat will have the overall responsibility for illustrations pertaining to canons, the penthrate grenade and the anatomy chapter.

The deadline for the production of the total manual is February 2014 when it will be presented to the Council at its annual meeting. The Committee therefore agreed that all text should be in a more or less finalised form by June 2013, giving enough time for layout and translation during fall 2013.

The Committee welcomed the funding received from NORA and the Norwegian Ministry of foreign Affairs.

#### **4. ELECTION OF OFFICERS**

Eyþór Björnsson (Iceland) was elected as chair for the period 2013- 2014. It was agreed that Greenland would be asked to fill the position as vice-chair for the period 2013 -2014. The Committee thanked the outgoing chair, Egil Ole Øen (Norway) for his efficient and professional chairmanship during the last eight years.

#### **5. NEXT MEETING**

The next ordinary meeting in the Committee will be January/February 2014. However due to the ongoing work with the manual it is anticipated that there will be necessary to hold additional meetings dedicated to the manual before 2014.

## **6. APPROVAL OF THE REPORT**

The report was approved by correspondence on 18 February 2013.

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## **REPORT OF THE COMMITTEE ON HUNTING METHODS - 2**

The Committee on Hunting Methods met on 25 and 26 November 2013 at the Greenlandic representation in Copenhagen. Present were Eypór Björnsson (Iceland), chair, Kathrine Ryeng, Hild Ynnesdal and Egil Ole Øen (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, Eypór Björnsson, welcomed the Committee members to the meeting. The draft agenda was adopted and Charlotte Winsnes acted as rapporteur.

### **2. UPDATES ON HUNTING METHODS IN MEMBER COUNTRIES**

The lists of laws and regulations in member countries (NAMMCO/HM-November 2013-3) and references on hunting methods (NAMMCO/HM-November 2013-2) were updated with additions from the Faroe Islands and Greenland. These updates are reflected in appendices 1 and 2 of this report.

#### **Faroe Islands**

Olsen (Faroe Islands) informed the meeting of the new Executive Order No 100 from July 5th 2013 on pilot whale hunting. The regulation describes in detail how the hunt should be carried out and organised, both before, during and after a catch. The authorised killing equipment is the spinal lance and the blowhole hook with rope of sisal or manila material. Furthermore a list of authorised whaling bays is included. It is anticipated that it will be a requirement for hunters to undertake a training course in the use of the blowhole hook and the spinal lance that will certify them as whale hunters. The courses will be held in 2014.

#### Whale catches in 2013

Pilot whales: 9 drives and a total of 968 animals caught

White sided dolphins: 1 drive and 430 animals caught

In addition there had been 2 sperm whale strandings in 2013.

Olsen reported that some hunters had produced their own spinal lances, but that for the future it would be a requirement that the authorities approve the spinal lances that are used in advance of a hunt.

The Committee welcomed the new Executive Order. The Committee furthermore strongly recommended that only the spinal lance as described in the NAMMCO Expert Group meeting on the killing of small cetaceans be accepted as the standard lance.

#### **Greenland**

Levermann (Greenland) informed the meeting that there were no new regulations pertaining to marine mammals in Greenland. Levermann also reported that Greenland had set national quotas for large whales in 2013 based on the advice from the IWC Scientific Committee due to the developments in

IWC where the Greenlandic quota proposal had been rejected at the last commission meeting. The quotas for 2013 for West Greenland: 178 Minke whales, 19 fin whales, 10 humpback whales, 2 bowhead whales and East Greenland: 12 Minke Whales.

There are 44 whaling boats with harpoon gun and 425 smaller boats in Greenland. In 2012 no bowheads had been caught. There are no quotas for small whales except for beluga and narwhal. Whale catches in 2012 were:

5 fin whale including 1 struck and lost

148 minke whale including 4 struck and lost in West Greenland and 2 in East Greenland

10 humpback including 3 struck and lost.

2 whales (1 fin whale and 1 humpback whale) were euthanized due to stress and sickness. 2 humpback whales were by-caught of which one was not found again and one was euthanized.

The hunting period for 2012 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.

One observation of a sperm whale stranding was made in 2012.

On request Levermann presented an overview of catch related data collected on large whales for 2005-2012 and reported annually to IWC. The Committee referred back to the NAMMCO Expert Group on killing of large whales and reiterated its recommendation that the same reporting form of TTD is used by all member countries. The overall assumption was that the presented Greenlandic data on TTD is biased high especially for those hunts where the TTD are estimated by the hunters and are not corrected by *post-mortem* examinations.

The Committee took note of the information presented by Greenland. The Committee suggested that future voluntary reporting of TTD data to the Committee should be modelled around the Norwegian manner of presenting this kind of data, and the Secretariat was tasked to find out exactly what this entailed.

### **Iceland**

Björnsson (Iceland) reported that there had been no new regulations for the hunting of fin and minke whales the last year. For 2013 the following information was given:

49 minke whales were caught by 3 boats and no struck and lost was reported.

134 fin whales were caught by 2 vessels and 5 struck and lost had been reported. The quota for 2014 is 229 minke whales and 150 fin whales.

Iceland plan to record TTD in 2014.

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 the last year.

In 2013 4 sealing vessels had taken 15 939 harp seals (young and adult). In relation to the quota for 2013 which was set at 25 000 adult (one year plus) animals, the hunt counted 9 019 animals derived from the counting system in Norway where two young seals counts as one adult seal. For the minke whale hunt 17 vessels had caught 593 minke whales of a quota of 1 286. 5 struck and lost minke whales had been reported.

TTD data have been collected in 2011 and 2012 on minke whales. This data will be presented in 2014. In 2013 Norway has been sampling TTD on seals and it is anticipated that these data also will be presented next year.

The Committee took note of the information presented by Norway.

### **3. HANDBOOK/USER MANUAL**

Presented under this agenda item were documents:

- NAMMCO/HM-November 2013-4 draft of manual Part A on canons and penthrite grenade – Norwegian version
- NAMMCO/HM-November 2013-5 draft of manual Part B on pilot whale hunt Faroe Islands – English version
- NAMMCO/HM-November /2013-6: draft of the User's manual Part C on the Greenlandic netting and rifle hunt of small whales – English version
- NAMMCO/HM-November /2013-7: draft English version of the part A with canons and grenade.

The Committee went through and finalised document 5 on pilot whaling - all corrections are found in appendix 3 to this report. There was a discussion in the meeting regarding adding a glossary to the manual with respect to anatomical expressions. This was later dismissed by correspondence with the rationale that there are no good “non anatomical” terms for these expressions.

The Committee also discussed document 4 on canons and grenades and all corrections are found in appendix 4. In general the Committee decided that each country would be responsible for including country specific appendices to the manual, it being equipment required onboard a whaling boat such as knives, boyos, pulling power for winches etc. The presented manual has a photo of a Norwegian whaling vessel and it was agreed that the Icelandic and Greenlandic versions should have a cover photo reflecting hunts of the country in question.

The Committee also decided that the English version of document 4 is a technical exercise and that this will be the responsibility of the Secretariat.

Levermann agreed to submit a draft on Greenlandic netting and rifle hunt by the end of December for the review of the Committee. The deadline for the production of the total manual is February 2014 when it will be presented to the Council at its annual meeting. It is therefore imperative that all parts of the manual are finalised by the end of January.

The Chair of the Committee in cooperation with the Secretariat will assess if there is a need for a face to face meeting before the manual is presented to Council, or if it will suffice to finalise the manual by correspondence.

The total manual including all translations consists of the following 3 parts and will be available at the NAMMCO homepage for downloading by member states and others:

#### **Manual on cannons and grenade:**

- Håndbok for vedlikehold og bruk av våpen og utstyr for fangst av bardehvaler i NAMMCOs medlemsland. (Norwegian version canons and grenade)
- Instruction manual for the use and maintenance of weaponry and equipment deployed in whaling in NAMMCO member countries. (English version of above)
- Icelandic version of canons and grenades
- Greenlandic version of canons and grenades

#### **Manual on pilot whaling:**

- Instruction manual on Pilot whaling (English version)



- Leiðbeining fyri avlívning av grindahvali (Faroese version of above)

**Manual on Greenlandic netting and rifle hunt small whales:**

- Instruction manual on Greenlandic netting and rifle hunt of small whales (English version)
- Greenlandic version of above

The Secretariat will prepare a paper copy of the English versions for presentation to Council. The Secretariat was asked to look into the cost of printing the manual in hard copies with or without waterproofed paper.

It was reiterated that it is the Committees responsibility to develop the manual in English and that it will be the member countries responsibility to translate the manual into the national languages. Member countries are responsible for how and in which form they will distribute the manual to the national hunters. The Committee strongly recommended that member countries initiate procedures to ensure that all whalers or whaling boats have a manual and also that there are some requirements in stalled to make sure that the whalers actually read the manual before going hunting.

The Committee also recommended that NAMMCO take the responsibility of printing a set for all member countries. It is anticipated that Norway will need 20, Iceland 10, Faroes 1000 and Greenland between 2000 and 5000 copies for the small whale manual and 50 copies for the large whale manual. It was recommended that Council ask the Secretariat to look into possible funding for the printing of this first set.

**4. NEXT MEETING**

The next ordinary meeting in the Committee will be January/February 2015. However if necessary in order to finalise the manual see agenda item 3, the Committee will meet prior to NAMMCO 22.

**5. ANY OTHER BUSINESS**

Levermann informed the Committee of an accident with a harpoon canon in Kangaamiut in the end of May 2013. Both the canon and the breechblock had been thoroughly examined afterwards without finding anything wrong.

**6. APPROVAL OF THE REPORT**

The report was approved by correspondence on 23 December 2013.

**LIST OF LAWS AND REGULATIONS IN NAMMCO MEMBER COUNTRIES**  
(Updated December 2013)

**FAROE ISLANDS**

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

**GREENLAND**

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

Catch registration form (1993-present) “*Piniarneq*”

**ICELAND**

|     |  |
|-----|--|
| Law | <p>No 26, May 3, 1949 on whaling</p> <p>No 40, June 1, 1979 on amendments to Law No 26/1949 on whaling</p> |
|-----|--|

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, Marej 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.

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### 1.3

## **REPORT OF THE COMMITTEE ON INSPECTION AND OBSERVATION**

The Committee on Inspection and Observation met at the Grand Hotel in Oslo on 24 February 2014. Present were Nette Levermann Chair (Greenland), Eyþór Björnsson (Iceland), Kathrine Ryeng, Egil Ole Øen and Hild Ynnesdal (Norway), and Ulla S Wang (Faroe Islands). Christina Lockyer, Jill Prewitt and 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 2013 SEASON**

Presented under this agenda item were documents NAMMCO/I&O-February/2014/2 containing the report from the Secretariat of the Observation Scheme for 2013 and NAMMCO/I&O-February/2014/3 containing the reports from the observer active in 2013.

Whaling in Iceland (fin and minke whale) and Norway (minke whale) had been the focus of the observation scheme in 2013. Three observers were contracted and no violations had been observed.

The Committee took note of the reports. All reports need to be signed and filled out in full. The Secretariat will follow up by contacting the observers.

It was further noted that next to scope, budget and availability of observers were the main deciding factors when implementing the scheme in any given year. The Committee reiterated the importance of having the implementation of the observation scheme independent of the member governments. Thus it is the Secretariat that suggests scope and budget and that implements the plans. However the Committee suggested that when the Secretariat presents the plans for the coming observation activities it would be informative to also receive as much information on geographical area, planned effort compared to the total fleet when applicable and a more detailed budget.

The scope of the 2014 activities are sealing in Norway and the Committee recommended Council to increase the effort by sending two observers.

### **3. TRAINING COURSE FOR OBSERVER CANDIDATES**

Presented under this agenda item was document NAMMCO/I&O-February/2014/4 summarising the observer candidates evaluation of the training course held in March 2013.

The summary had previously been distributed by email without having been discussed by the Committee. Most members of the Committee had participated in the course and the general impression was that the course had been a success. This was confirmed by the candidates in their evaluation where all underlined that the course had increased their understanding of the job and they felt competent to go out as observers for NAMMCO. The course was held in a Scandinavian language (Norwegian, Danish or a mix), and one reoccurring comment in the evaluation was the language barrier. All participants did not fully comprehend everything that was said, and the Committee noted that language will probably always represent a challenge given the different languages in the NAMMCO member countries. Another important comment was that most participants would like to have a stronger emphasis on the practical aspects of being an observer out in the field.

The Committee underlined the importance of developing control/check lists in relation to national legislation that should be part of the observer kit. It was noted that this was the responsibility of each member country and that Norway and the Faroe Islands still needed to submit their lists with a deadline of April and June respectively.

The Committee anticipated that the next training course will be when new candidates replace the present pool of observer candidates. The Committee also asked the Secretariat to distribute the presentations held at the course.

#### **4. INFORMATION ON NAMMCO HOMEPAGE**

The Committee had been asked to consider how the Observer Scheme and the Committee itself could be more visible and dynamic on the NAMMCO web page.

The Committee recommended that a first effort should be the updating of already displayed information such as committee members and relevant documents. It was suggested to develop short, to the point information sheets on the different hunts in the NAMMCO member countries and the laws and regulations governing these hunts for display on the homepage. The Committee furthermore agreed that with respect to the observation scheme information like the scope and effort of the activities should be on the web especially from previous years whereas information on ongoing activities should be held to a minimum. No observer reports should be on the homepage.

#### **5. UPDATE ON NATIONAL MONITORING DATA**

At its last meeting the Committee agreed to include the updating of national monitoring data as a regular item on the agenda.

Norway informed that there had been no data collection in 2013 pertaining to whaling. Data collected in 2011 and 2012 on time to death in whaling would be published in 2015. The electronic monitoring system (the blue box) continues to collect data on each vessel, and inspectors are only on board hunting vessels at random.

With respect to sealing it is customary in Norway to have inspectors (veterinarians) on all sealing vessels that also control food quality. Data had been, and will be collected, in 2013 and 2014 in relation to a research project looking into efficiency of killing methods and weapons in sealing.

Iceland informed that they plan to collect Time to Death (TTD) data in 2014. The idea is to use the Norwegian model and use veterinarians. In 2013, in addition to the hunts observed by the NAMMCO observer, inspectors were present during two hunting trips.

The Faroe Islands informed that some scientific data collection had taken place. In connection with the new regulation on pilot whaling and the introduction of the new spinal lance and blow-hole hook training courses will be held in 2014. In the making is also a film depicting the hunting method with the new equipment.

Greenland informed that the wildlife officers as part of the regular national control have followed and controlled large whale hunts and beluga and narwhale hunts.

#### **6. RULES OF PROCEDURE FOR THE COMMITTEE**

Presented under this agenda item was document NAMMCO/I&O-February/2014/5 containing a draft Rules of Procedure (RoP) for the Committee as recommended by the FAC. The Council at NAMMCO 21 tasked the Committee to make a RoP to be presented to the Finance and administration Committee (FAC). The Committee's RoP had been presented to FAC who made two alterations limiting member countries to have two representatives in the Committee.

The Committee disagreed with the recommendation from FAC and asked that the issue be discussed in Council.

#### **7. TEMPLATE FOR OBSERVER CANDIDATES CV**

Presented under this agenda item was document NAMMCO/I&O-February/2014/6 containing the template CV for observer candidates that had been adopted by correspondence 27 February 2013.

There have been great differences as to how the nominated candidates have been presented and the Committee therefore agreed that a standardised *CV* would make it easier to assess the different candidates during the nomination process. By mistake the *CV* had not been used in connection with the implementation of the 2013 observation season.

With respect to 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.

## **8. NEXT MEETING**

The next face to face meeting will be held prior to NAMMCO 23 – tentatively in January 2015, and if possible back to back with the Committee on Hunting Methods.

## **9. REPORT OF THE MEETING**

The Chair of the Committee reported the main issues from this meeting to Council during NAMMCO22. The final written report was approved by correspondence on 31 March 2014.



## SECTION 2 - MANAGEMENT COMMITTEES

|            |  |           |
|------------|--|-----------|
| <b>2.1</b> | <b>Report of the Management Committee for Cetaceans .....</b>  | <b>55</b> |
|            | Appendix 1    Agenda .....   | 67        |
|            | Appendix 2    List of Documents .....  | 70        |
|            | Appendix 3    Recommendations to member countries .....  | 71        |
| <b>2.2</b> | <b>Report of the Management Committee for Seals and Walruses .....</b>                                   | <b>73</b> |
|            | Appendix 1    Agenda .....   | 81        |
|            | Appendix 2    List of Documents .....  | 83        |
|            | Appendix 3    Recommendations to member countries .....  | 84        |
|            | ANNEX 1      List of current Proposals for Conservation and Management .....                             | 85        |
|            | ANNEX 2      Summary of current Requests by Council to the Scientific Committee<br>and its Response..... | 114       |



## 2.1

### REPORT OF THE MEETING OF THE MANAGEMENT COMMITTEE FOR CETACEANS

26 February 2014, Oslo, Norway

#### 1. CHAIRPERSON'S OPENING REMARKS

The Chair, Ulla S. Wang (Faroe Islands), opened the meeting and welcomed all participants (Address Section 5.3).

#### 2. ADOPTION OF AGENDA

The agenda (Appendix 1) was adopted. The Chair informed the Management Committee for Cetaceans (MC) that agenda items 6. to 9. would be discussed in a joint session with the Management Committee for Seals and Walrus.

#### 3. APPOINTMENT OF RAPPORTEUR

Jill Prewitt (Scientific Secretary) was appointed as rapporteur.

#### 4. CONSERVATION AND MANAGEMENT MEASURES FOR WHALE STOCKS

Documents to the meeting were listed in Appendix 2. The Chair of the MC Cetaceans, Ulla S. Wang (Faroe Islands), informed the MC that past proposals for conservation and management and responses with reference to document NAMMCO/22/MC/3 (Section 2.2 Annex 1) and past requests to the Scientific Committee and responses with reference to document NAMMCO/22/MC/4 (Section 2.2 Annex 2), and NAMMCO/22/MC/5 (NAMMCO Annual report 2012, Section 2.1, Appendix 3) – recommendations to member countries in 2012, would be summarised under each species agenda item.

All new recommendations to member countries on scientific research arising and approved by the Management Committee for Cetaceans in 2014 are contained in Appendix 3.

Also under the agenda item for each species, the Chair of the Scientific Committee, Thorvaldur Gunnlaugsson (Iceland), presented the information on whale stocks from the Scientific Committee report (NAMMCO/22/5, Section 3).

##### 4.1. Fin whales

##### Status of past proposals for conservation and management

The past recommendation to carry out simulation trials was summarised and discussed further in relation to **R-3.1.7**.

##### Requests from Council for advice from the Scientific Committee

There was one ongoing request to the Scientific Committee:

**R-3.1.7 – NAMMCO/17-2008 (Ongoing):** 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.

##### Update from the Scientific Committee

Catch limits for fin whales in Icelandic waters are based on management advice provided by the Scientific Committee of NAMMCO and the work of the Scientific Committee of the IWC using its Revised Management Procedure (RMP). The latest advice was for an annual catch of 154 whales in the West Iceland area and applies for the period 2011-2015. The Marine Research Institute (MRI, Iceland) has already provided advice for the years 2014 and 2015 in accordance with this advice from NAMMCO. No catches of fin whales were taken in 2011 and 2012 but 134 animals were taken in 2013. The catches taken during 2011-2013 amount to 29% of the TAC set for this period and 17% of the NAMMCO advice for the five year period (2011-2015).

In 2013 the Scientific Committee of the IWC initiated a RMP implementation review for North Atlantic fin whales. The review could not be completed as planned in 2013 and will be finalized in 2014. The IWC Scientific Committee agreed changes to the range of MSYR to be applied in the RMP. These changes required time consuming re-running of all simulation trials underway within the IWC. Until these are finalized, there is no point in carrying out re-runs with 0.6 tuning level recommended by the NAMMCO Scientific Committee. There are also some unresolved questions about stock structure hypotheses in IWC that may require additional runs, however, these stock structure concerns were not shared by the NAMMCO Scientific Committee and it can therefore move forward with an assessment. As the present advice expires in 2015, the NAMMCO Scientific Committee **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.

#### Updates from Member Countries

Greenland reported that they have been following the advice on quotas from the Scientific Committee of the IWC on 19 whales. The quota of 19 had not been used last year when 9 whales were caught.

Greenland requests the NAMMCO Scientific Committee to give information on sustainable yield based on new abundance estimates expected from T-NASS 2015 for all large baleen whales in West Greenland waters.

#### Conclusions by the Management Committee

The Management Committee **endorsed** the Scientific Committee recommendation for a Large Whale Assessment Working Group to convene in the autumn 2014.

**New request R-1.7.12:** The Management Committee **requests** the Scientific Committee to give information on sustainable yield based on new abundance estimates expected from T-NASS 2015 for all large baleen whales in West Greenland waters.

#### **4.2. Humpback whales**

##### Status of past proposals for conservation and management

Nothing new to report.

##### Requests by Council for advice from the Scientific Committee

There was one pending request to the Scientific Committee:

**R-3.2.4 - NAMMCO/15-2006:** to conduct a formal assessment following the completion of the T-NASS. Furthermore to investigate the relationship between the humpback whales summering in West Greenland and other areas and incorporate this knowledge into the estimate of sustainable yields of West Greenland humpback whales.

##### Update from the Scientific Committee

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 Scientific Committee noted that it had completed the assessment for West Greenlandic waters. The Scientific Committee has not yet initiated 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 Scientific Committee will consider this request in conjunction with the fin whale meeting.

#### Updates from Member Countries

Greenland reported that they have been following the advice on quotas from the Scientific Committee of the IWC on 10 whales. The quota of 10 had not been used last year where 8 whales were caught.

#### Conclusions by the Management Committee

The Management Committee **concluded** that the Large Whale Assessment Working Group should not consider humpback whales at the upcoming meeting in the autumn 2014.

#### **4.3. Sei whales**

##### Status of past proposals for Conservation and Management



No past proposals.

#### **Requests from Council for advice from the Scientific Committee**

There was one pending request to the Scientific Committee:

**R-3.5.3 amended NAMMCO/19-2010 (Ongoing):** 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**

**R-3.5.3:** There is no new information available with regards to this request.

The Scientific Committee noted that the Scientific Committee 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 Scientific Committee agreed to monitor the outcome of the IWC Scientific Committee review of available data scheduled in 2014 before proceeding with an assessment.

Sei whales are not a T-NASS 2015 priority, but the survey may provide new information for abundance estimate.

#### **Conclusions by the Management Committee**

The Management Committee **endorsed** the Scientific Committee recommendation to wait for the outcome of the IWC Scientific Committee review before proceeding with an assessment.

### **4.4. Minke whales**

#### **Status of past proposals for Conservation and Management**

There were no past proposals for Conservation and Management to discuss.

#### **Requests from Council for advice from the Scientific Committee**

There was one ongoing request (**R-3.3.4**) specific to minke whales, and one request from the Marine Mammals and Fisheries Interactions (**R-1.1.6**) regarding minke whales, from Council to the Scientific Committee:

**R-3.3.4 - NAMMCO/17-2008 (Ongoing):** 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-1.1.6 – NAMMCO/16 02-2007 (Ongoing):** The Commission requested the Scientific Committee to review the results of the Icelandic programme on the feeding ecology of minke whales and multi-species modelling as soon as these become available.

#### **Update from the Scientific Committee**

**R-3.3.4** [this request was not discussed at the Scientific Committee meeting]

Regarding **R-1.1.6**, from NAMMCO/22/5 (SC20 Report): The Scientific Committee draws the attention of the MC to the results from the IWC Expert Panel review process and the response papers (Vikingsson *et al.* 2013) and reports (IWC SC/65A/Rep03) detailing the results from the program. The Scientific Committee notes that the quality of the research will be further determined through the peer-review publication process. The Scientific Committee also **acknowledged** that the IWC review is set according to guidelines set by the IWC for the reviewers — for example, reviewers focused on whether this research can be done using non-lethal means, and how these data can be used in assessments. These are not necessarily same criteria that NAMMCO might use.

The Scientific Committee awaits guidance from the council concerning potential further review of the results within NAMMCO.

Updates from Member Countries

Greenland reported that they have been following the advice on quotas from the Scientific Committee of the IWC of 12 whales in East Greenland. Last year there had been 3 reported catches.

For West Greenland the quota advice from the IWC Scientific Committee of 178 whales had been followed, and last year 170 catches was reported. Greenland is following the new quota advice from the IWC Scientific Committee on 164 whales for this season.

Greenland requests the NAMMCO Scientific Committee to give information on sustainable yield based on new abundance estimates expected from T-NASS 2015 for all large baleen whales in West Greenland waters.

#### **Conclusions by the Management Committee**

In regards to **R-3.3.4**: The Management Committee **noted** that there was no new information regarding this request, and **reiterated** that the Scientific Committee should address this request when new information becomes available.

In regards to **R-1.1.6**, the Management Committee **concluded** that the Scientific Committee does not need to do any further review of the Icelandic Minke Whale Research Program in addition to the work already completed by the IWC Expert Panel.

**New request R-1.7.12**: The Management Committee **requests** the Scientific Committee to give information on sustainable yield based on new abundance estimates expected from T-NASS 2015 for all large baleen whales in West Greenland waters. (See also under 4.1 Fin whales.)

#### **4.5 Narwhal – West Greenland**

##### **Status of past proposals for Conservation and Management**

Greenland provided an update on the previous MC recommendation of data collection on struck and lost that this advice has been followed and a new campaign has been implemented. This campaign is not species specific. There were some problems with reporting, likely due to some hesitance by the hunters to report struck and lost because these count against the quota. The JCNB has discussed other ways of including struck and lost including research into mortality/survivability of struck and lost animals. Greenland also informed the MC that they are implementing a new electronic reporting system.

##### **Requests for advice from the Scientific Committee**

There were four ongoing requests to the Scientific Committee:

**R-3.4.9 - NAMMCO/15-2005 (Ongoing)**: to 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. In 2009 (NAMMCO/18) it was further specified that there was no need for a broad assessment for all marine mammals, and that focus would be on walrus, narwhal and beluga (ongoing).

**R-3.4.10 - NAMMCO/14-2005 (Ongoing)**: future surveys for beluga and narwhal should be planned using the international expertise available through the Scientific Committee, and with input from hunters at the planning stage. In addition, if and when new survey methods are applied, they should be calibrated against previously used methods so that the validity of the survey series for determining trends in abundance is ensured.

**R-3.4.11 – NAMMCO/17-2008 (Standing)**: to update the assessment of both narwhal and beluga when new data are available.

**R-3.4.12 - NAMMCO/19-2010 (Ongoing)**: to provide advice on sustainable takes for narwhal from the Kane Basin in spring, summer and fall.

##### **Advice from the Scientific Committee**

Relating to **R- 3.4.9**: In 2011, the Scientific Committee proposed a symposium on beluga and narwhals in relation to disturbance and industrial activities. The IWC is holding a workshop about the effects disturbance on cetaceans in general in the Arctic March 2014. The Scientific Committee **noted** that this meeting is not redundant with respect to the originally envisaged NAMMCO Scientific Committee symposium focusing on

narwhals and beluga. The Scientific Committee **recommends** this symposium to be held in 2015 and awaits further guidance from Council before proceeding with the planning.

Relating to **R-3.4.12**: A subgroup of the Joint Scientific Working Group (JWG) of NAMMCO and the JCNB is scheduled to meet in 10–12 March 2014 in Copenhagen to decide on catch allocations of narwhals in Baffin Bay.

The Scientific Committee discussed an invitation from the Scientific Committee of the IWC to hold a joint scientific symposium, “*Global Review of Monodontids*”. The idea is that this would be a joint NAMMCO-IWC meeting that will include a global review of all stocks of monodontids. This meeting would create the opportunity for experts working on monodontids to exchange information and technology with researchers from within and outside of NAMMCO countries. This global review will not replace the ongoing assessment work in the JCNB.

The Scientific Committee **noted** that the Marine Mammals of the Holarctic biennial international conference could be an alternate venue for exchange of scientific information on belugas with scientists, and this conference would be a useful meeting to have participation from a NAMMCO observer. The Scientific Committee was informed that the next meeting is in September 2014 in St. Petersburg, Russia. The Scientific Committee noted that perhaps a global review of monodontids meeting should be held back to back with the following meeting (in 2016).

#### Updates from Member Countries

Greenland reported that they followed the management advice from the JWG of the NAMMCO/JCNB with a quota level with a probability of continued growth of 70 % or more until 2016 for narwhal.

#### **Conclusions by the Management Committee**

The Management Committee **endorsed** the Scientific Committee recommendation to continue planning of a symposium on effects of disturbance on narwhal and beluga to be held in 2015, and also **recommended** including walrus.

Regarding the proposed “*Global Review of Monodontids*” symposium, the Management Committee concluded that the IWC invitation cannot be accepted as originally envisaged. The MC discussed possible alternatives, and **recommends** that this should be further discussed inter-sessionally.

#### **4.6 Beluga - West Greenland**

##### **Status of past proposals for Conservation and Management**

There were no past proposals that need to be addressed.

##### **Requests by Council for advice from the Scientific Committee**

There were four ongoing requests to the Scientific Committee:

**R-3.4.9 - NAMMCO/15-2005 (Ongoing)**: to 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. In 2009 (NAMMCO/18) it was further specified that there was no need for a broad assessment for all marine mammals, and that focus would be on walrus, narwhal and beluga.

**R-3.4.10 - NAMMCO/15–2005 (Ongoing)**: future surveys for beluga and narwhal should be planned using the international expertise available through the Scientific Committee of NAMMCO, and with input from hunters at the planning stage. In addition, if and when new survey methods are applied, they should be calibrated against previously used methods so that the validity of the survey series for determining trends in abundance is ensured (ongoing).

**R-3.4.11 (Standing) – NAMMCO/17-2008**: to update the assessment of both narwhal and beluga when new data are available.

**R-3.4.13 - NAMMCO/19-2010 (Ongoing):** In view of recent dynamic changes in the environment the Scientific Committee is requested to reconsider the temporal and geographical restrictions on the takes of beluga from West Greenland within the framework of the JWG of the NAMMCO/JCNB.

**Advice from the Scientific Committee**

See above (in section 4.5 Narwhals) regarding **R-3.4.9** and a proposed symposium on beluga and narwhals in relation to disturbance and industrial activities.

There is no new information on **R-3.4.13**.

**Updates from Member Countries**

Greenland reported that they followed the management advice from the JWG of the JCNB/NAMMCO with a quota level with a probability of continued growth of 70 % or more until 2016 for beluga.

Greenland reported that there were 2 non-intended catches off East Greenland (1 by-catch, 1 mistaken as narwhal). Greenland is investigating possible research on any future incidental catches, such as obtaining samples for stock identity since it is unknown whether these animals are from the West Greenland or Svalbard stocks.

**Conclusions by the Management Committee**

**R.3.4.13.** Greenland reported that this request was discussed thoroughly at the meeting in 2012 but could not see that it was reflected in the report from the meeting. The Management Committee views this request as **completed**.

**4.7 Northern bottlenose whales**

**Status of past proposals for conservation and management**

There were no recent past proposals to discuss.

**Requests by Council for advice from the Scientific Committee**

There are no active requests for advice from Council to the Scientific Committee.

**Update from the Scientific Committee**

From the catch statistics in the NPR-G appendices, low levels of catches were noted (20 animals). The Scientific Committee **recommends** that these catch statistics be validated, since to our knowledge there have not been confirmed catches since the 1950s.

**Updates from Member Countries**

Greenland has already started the process of validating the reports. The problems could be due to issues with how the form is structured and hunters entering the catches under an incorrect species. These catches were likely harbour porpoises, not northern bottlenose whales.

**Conclusion by the Management Committee**

The Management Committee endorsed the Scientific Committee recommendation that the catch statistics be validated.

**4.8 Killer whales**

**Status of past proposals for Conservation and Management**

No previous proposals for Conservation and Management

**Requests by Council for advice from the Scientific Committee**

There is one pending request:

**R-3.7.2-NAMMCO/13-2004 (Ongoing):** 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.

**Update from the Scientific Committee**

Regarding **R-3.7.2**, the Scientific Committee again **noted** that there is not sufficient new information to answer this request at this time.

The Scientific Committee discussed a report on a recent increase in catches of killer whales off Tasiilaq in East Greenland (8 on average per year from 2010 to 2012). Samples have been collected, and genetics indicate that these animals are related to Norwegian herring-eating killer whales (Foote *et al.* 2013). However, only marine mammals (including harp seal pups, and a hooded seal) have been found in the stomachs of caught whales. The authors also report the possibility of a high struck and lost rate in this hunt.

The Scientific Committee **noted** higher levels of annual catches (19 on average per year from 2010 and 2012) also in West Greenland. The Scientific Committee was informed that the recent catch statistics on killer whales in West Greenland have not been validated. As for bottlenose whales, the Scientific Committee **recommends** that all catch data on killer whales are validated before the next Scientific Committee meeting, so that it is possible for the Scientific Committee to monitor the development of the hunt.

#### Updates from Member Countries

As with bottlenose whales, some of the inconsistencies with catch data are likely due to issues with how the form is structured, and mistakes by the hunters entering the data. Greenland reported that the Greenland Institute for Natural Resources (GINR) has started the process of validating the catch data.

#### Conclusions by the Management Committee

The Management Committee **noted** that there was no new information regarding request **R-3.7.2**.

#### **4.9 Long-finned pilot whales**

##### Status of past proposals for conservation and management

There were no past proposals that need to be addressed.

##### Requests by Council for advice from the Scientific Committee

There were four ongoing requests for advice from the Scientific Committee:

**R-3.8.3 - NAMMCO/16 02-2007 (Standing):** The Management Committee noted that it had been over 10 years since the Scientific Committee concluded its assessment of pilot whales. It was recommended then that a monitoring programme for pilot whales caught in the Faroese 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.

**R-3.8.4 - NAMMCO/16 02-2007 (Ongoing):** 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 Scientific Committee 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/19-2010 (Ongoing):** 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/20-2011 (Ongoing):** 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.

#### Advice from the Scientific Committee

The Scientific Committee Chair updated the MC on the re-analysis of T-NASS 2007 data. The NASS - T-NASS surveys subsequent to the 1989 survey have indicated decreasing abundance of pilot whales. However, estimates of pilot whale abundance derived using conventional distance sampling (CDS) from the five NASS

- T-NASS surveys are not directly comparable to one another because of different survey extents and, in the case of the 1989 NASS, different survey timing. Therefore, the NAMMCO SC-17 **recommended** 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. In 2011, NAMMCO SC-19 **recommended** developing this index only using the three largest surveys and including the data from the CODA survey for enlarging the reference area.

The results of this reanalysis (see NAMMCO/22/5, pp. 37-39, Section 3, pp. 186-88) 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 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 Faroe Islands, should be of concern for managers.

A new assessment of pilot whales should consider the trend analysis but should await a new abundance estimate from the planned T-NASS 2015 sightings survey.

The Faroese part of T-NASS 2015 will target pilot whales, and it is recommended to use tracking data in the allocation of survey effort. It is also recommended to investigate potential cooperation with SCANS-III, with the reservation that these surveys are not planned for the same year.

The satellite tracking programme is ongoing. There have been problems with longevity of the tags (longest track so far 133 days) and to get access to pods for tagging. It is **recommended** that more tracking data are collected, especially from offshore areas, with a focus on the period during sightings surveys (July-August). The Scientific Committee also **recommended** that the trend data and tracking data should be taken into consideration by the T-NASS 2015 planning group (see NAMMCO/22/6 for response from the 3 February 2014 meeting of the T-NASS 2015 Steering Group).

#### Updates from Member Countries

The MC commented on the wording of “concern for managers” in the Scientific Committee report. Mikkelsen (Faroes) reported that the concern lies with the issue that it is unknown how the animals in the abundance estimates are related to the stocks that contribute to the hunt in the Faroes. Ongoing work will continue into abundance estimates and stock identity.

#### **Conclusions by the Management Committee**

The Management Committee **noted** the report of the Scientific Committee.

The Management Committee **noted** that a new abundance estimate for pilot whales is anticipated after T-NASS 2015.

#### **4.10 White-beaked, white-sided and bottlenose dolphins**

##### **Status of past proposals for conservation and management**

No past proposals.

##### **Requests from Council for advice from the Scientific Committee**

There was one pending request to the Scientific Committee:

**R-3.9.6 - NAMMCO/13-2004 (Pending):** to carry out assessments of these species when sufficient information was available on stock delineation, distribution, abundance and biological parameters to initiate the work.

##### **Advice from the Scientific Committee**

There is no new information in regards to this request (**R-3.9.6**).

#### Updates from Member Countries

The Faroe Islands reported that there is a harvest of white-sided dolphins, sometimes while in mixed schools with pilot whales, and a smaller number of directed catches. In recent years, directed catches have been lower than in previous years. The scientific program of sample collection to investigate biological parameters continues.

#### **Conclusions by the Management Committee**

The Management Committee **noted** that there was no new information regarding request **R-3.9.6**.

#### **4.11 Harbour porpoise**

##### **Status of past proposals for conservation and management**

No past proposals to discuss.

#### **Requests for advice from the Scientific Committee**

There is one ongoing request to the Scientific Committee:

**R-3.10.1 - NAMMCO/7-1997:** to conduct a comprehensive assessment of the harbour porpoise throughout its North Atlantic range.

#### **Advice from the Scientific Committee**

The Harbour Porpoise Working Group met in November 2013 in Copenhagen (see Annex 1 of NAMMCO/22/5).

Taking into consideration the work of the HP WG, the Scientific Committee **recommends** the following for Greenland:

1. Given the recent discovery of large uncertainty in catches, the SC **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.
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

Taking into consideration the work of the HP WG, the Scientific Committee **recommends** for 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).
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.

The next meeting of the HP WG is deferred until new abundance estimates are available.

#### Updates from Member Countries

##### Greenland

Greenland reported that GINR had initiated a questionnaire survey, and compared hunter reports to the reported catch. There were some differences between these, and Greenland is investigating these issues and will report back to the MC in the future.

##### Norway

Bjørge provided background information on the by-catch monitoring programme, exploring the use of “pingers”. They reported that preliminary tests were not successful due to “pinger” failure at the depths of the Norwegian fisheries. Norway is further exploring methods for reducing by-catch, primarily using “pingers” if

some can be found that will work at the depths necessary. Work is underway for beginning monitoring of the lumpfish fishery, and collecting genetics data.

#### **Conclusions by the Management Committee**

The Management Committee **endorsed the Scientific Committee** recommendations on Harbour Porpoise for Greenland and Norway.

#### **4.12 Bowhead whale**

##### **Status of past proposals for conservation and management**

No past proposals.

##### **Update by the Scientific Committee**

The Scientific Committee reported that aerial surveys were conducted in 2012 in West Greenland. An abundance estimate using genetic mark/recapture gave a higher abundance estimate likely because the genetics represent the whole influx of animals. The Scientific Committee also reported that acoustic studies both in Greenland and Svalbard are ongoing.

##### **Updates from Member Countries**

Greenland informed that there were no catches of bowhead whales (none of the annual quota of 2 whales was used) in 2012 and 2013, but they wish to keep part of this shared Canadian/Greenlandic quota based on the advice from the Scientific Committee of the IWC.

Greenland requests the NAMMCO Scientific Committee to give information on sustainable yield based on new abundance estimates expected from T-NASS 2015 for all large baleen whales in West Greenland waters.

#### **Conclusions by the Management Committee**

MC **noted** the SC report on the ongoing research.

**New request R-1.7.12:** The Management Committee requests the Scientific Committee to give information on sustainable yield based on new abundance estimates expected from TNASS2015 for all large baleen whales in West Greenland waters. (See also 4.1 fin whales and 4.4 minke whales.)

#### **4.13 Sperm whale**

##### **Status of past proposals for Conservation and Management**

No past proposals.

##### **Update by the Scientific Committee:**

Scientific Committee Chair informed the MC that the T-NASS 2007 acoustics data were re-analysed via contract work. Most detections were of delphinids. The results showed only 11 sperm whale detections. However, it could be interesting to compare acoustic detections with sightings.

#### **Conclusions by the Management Committee**

The Management Committee **noted** this report and does not request any further analysis of the data.

### **5. T-NASS 2015 AND SURVEY PLANNING**

The T-NASS 2015 Steering Group **recommends** a Survey Planning Working Group meeting summer/autumn 2014, and another Steering Group meeting before the survey (early 2015).

#### **Conclusions by the Management Committee**

The Management Committee **expressed their support** of this project, and the planning activities. In addition the Management Committee also **recommends** the inclusion of other range states in the planning process for T-NASS 2015.

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

### **6.1 General Models**

No new information or issues raised under this agenda item.



## JOINT SESSION OF BOTH MANAGEMENT COMMITTEES

### 7. ECOSYSTEM-BASED MANAGEMENT

Greenland inquired about any update from member countries' participation in the Arctic Council Experts Group on Arctic Ecosystem-Based Management (EBM) since the last meeting of 3-5 October, 2012, Tromsø, Norway. The observer's report was in NAMMCO/22/12.

Greenland inquired whether any member countries were using Ecosystem Based Management. The Management Committee stated that there was no new information on this topic.

### 8. USER KNOWLEDGE IN MANAGEMENT DECISION-MAKING

#### **Status of past proposals for conservation and management**

Arne Bjørge (Norway) provided an observer's report of the presentation at the University of Tromsø of a project involving Traditional Ecological Knowledge. The project "Traditional indigenous knowledge in the 21st century" organized a workshop in collaboration with the project "Mapping cultural seascapes" at the Fram Centre on the 15th of November 2012. The workshop contained presentations on theoretical approaches to research on traditional knowledge (Bjørkan 2011), as well as presentations on the application of and research on traditional indigenous knowledge concerning climate and the environment in contemporary Sámi societies. NINA researcher Hans Tømmervik presented research on traditional ecological knowledge regarding snow and ice conditions of Sámi reindeer herders (Riseth *et al.* 2010), while Morten Falkegård presented the experiences of salmon biologists relative to the local ecological knowledge of Sámi salmon fishers. Einar Eythorsson presented the methods employed by NIKU in collecting knowledge on historical landscape use as well as local ecological knowledge among Sámi and other coastal dweller's knowledge on changing ecological conditions in the marine environment (Eythorsson and Brattland 2012). The discussion revealed different approaches to including non-scientific knowledge in research depending on the research questions, interests and research objects of the various Fram centre research projects. The possibility of a larger Fram-centre project on interdisciplinary collaboration in research on traditional/local ecological knowledge was also discussed. Present at the workshop were researchers from the Institute of Marine Research (IMR), NINA, NIKU, CICERO, Akvaplan Niva, NGU, the Centre for Sami Studies and the Norwegian College of Fishery Science, and employees and students at the University of Tromsø.

Greenland provided a presentation on a pilot project "Opening Doors to Native Knowledge" that was initiated in 2009 and is ongoing. There are 4 main goals of the project: 1) Increase the local capacity to quantify, document and manage the living resources as well as collecting data on wind, weather and ice conditions, 2) Increase local involvement in nature management and resource utilization, 3) Increase the ability to change management in response to changes in population sizes and distribution, and 4) Increase the dialogue between fishermen and hunters, scientists and management. So far, the experience is that this project 1) strengthened the documentation of the locals' knowledge of the living resources, wind, weather and ice conditions, 2) made the traditional knowledge quantitative and available in written form, 3) promoted local discussion, analysis and interpretation of changes in the living resources, 4) made local knowledge available to the municipality and the Government, 5) creates a forum for dialogue between towns / villages and the Government, 6) can increase the villages' and cities' opportunities for local government, 7) can shorten the time between observed changes and management actions. Further information about the project can be found at [www.pisuna.org](http://www.pisuna.org).

The Management Committee **noted** these presentations.

### 9. RELATED MANAGEMENT ISSUES

#### **9.1 Marine mammal - fisheries interactions**

##### **Status of past proposals for conservation and management**

The Management Committee noted that the MAREFRAME project was reported on during the Council meeting.

## 9.2 Environmental questions

At NAMMCO/21 in 2012, the Management Committee **underlined** the serious situation for ice-breeding seals when the extent and quality of sea ice is rapidly changing under the current climate change.

The Scientific Committee (Report of 20<sup>th</sup> meeting) **noted** that changing sea ice conditions will need to be taken into account, and will add to the uncertainties in regard to ice-breeding seal assessments. These issues were further discussed in the species updates for harp, hooded and ringed seals, and were also **noted** for walrus.

The Management Committee **noted** the discussion in Council agenda item 9 and the response of the Scientific Committee to this issue.

## 9.3 By-catch data and monitoring

Norway reported the continued monitoring of the marine mammal by-catches in the coastal fleet, including harbour porpoises, and also harbour seals and grey seals.

The Faroe Islands reported that they are in the process of implementing electronic logbooks for fishing vessels, where reporting of marine mammal by-catches is mandatory. Although it is in the early stages, early data has not shown substantial by-catches but the program will continue.

Greenland reported that there has been a revision of their by-catch and struck and lost reporting system to make them more standardised.

Iceland reported that there was an amendment to the current legislation to logbooks, making reporting of marine mammal by-catches more standardised reporting.

The Management Committee **noted** the updates from each country, and that by-catch data is being collected in all countries.

## 9.4 Other topics

No new topics were raised.

## 10. ANY OTHER BUSINESS

The Management Committee **noted** the Scientific Committees use of the word “strongly” and asks for more clarification of the Scientific Committees use of this wording.

Greenland noted the report on a meeting arranged by the bio-ethics committee of the Nordic Council of Ministers in Reykjavik on “Ethical issues and the public attitude towards the hunting of marine mammals: An exercise in critical thinking.” The Management Committee **refers** this report to the planning group on Marine Mammals and Food Security

The Management Committee **noted** that it would be of interest to the MC to receive information on changes or updates to legislation under each species during future MC meetings.

## 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
  - 4.7 Northern bottlenose whales
    - Proposals for Conservation and Management
    - Updates
  - 4.8 Killer whales
    - Greenland*

## Report of the Management Committee on Cetaceans

- Requests by Council for advice from the Scientific Committee
  - Updates
- 4.9 Long-finned pilot whales  
*Faroe Islands*
- 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*  
*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
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
7. ECOSYSTEM-BASED MANAGEMENT<sup>1</sup>
8. USER KNOWLEDGE IN MANAGEMENT DECISION-MAKING<sup>2</sup>
9. RELATED MANAGEMENT ISSUES<sup>3</sup>
- 9.1 Marine mammal - fisheries interactions<sup>4</sup>
- 9.2 Environmental questions

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<sup>1</sup> **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.

<sup>2</sup> **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.

<sup>3</sup> **Agenda Item 9:** 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 Seals and Walruses, 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.

<sup>4</sup> **Agenda Item 9.1:** This item also includes Economic aspects of marine mammal – fisheries interactions and Multi-species approaches to management.

9.3 By-catch data and monitoring

9.4 Other topics

10. ANY OTHER BUSINESS

**LIST OF DOCUMENTS**

| <b>Document no</b>      | <b>Title</b>   | <b>Agenda item</b>    |
|-------------------------|--|-----------------------|
| NAMMCO/22/MC/1          | List of Documents  |                       |
| NAMMCO/22/MC/2          | Draft Agenda   | 2.                    |
| NAMMCO/22/MC/3          | Status of Past Proposals for Conservation and Management   | 4., 5., 6. and 9.     |
| NAMMCO/22/MC/4          | Summary of Requests by NAMMCO Council to the Scientific Committee, and Responses by the Scientific Committee | 4.                    |
| NAMMCO/22/MC/5          | Recommendations to member countries 2012   | 4.                    |
| NAMMCO/22/5 and ANNEX 1 | Report of the Twentieth Meeting of the Scientific Committee  | 4., 5., 6., 7. and 9. |

## RECOMMENDATIONS TO MEMBER COUNTRIES 2014

### Harbour Porpoise

#### *Greenland*

The MC **recommends** the following for Greenland:

1. Given the recent discovery of large uncertainty in catches, the SC **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.
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*

The MC **recommends** for 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).
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.





## 2.2

### **REPORT OF THE MEETING OF THE MANAGEMENT COMMITTEE FOR SEALS AND WALRUS**

26 February 2014, Oslo, Norway

#### **1. CHAIRPERSON'S OPENING REMARKS**

The Chair, Hild Ynnesdal, Norway, opened the meeting and welcomed all participants (Address Section 5.3).

#### **2. ADOPTION OF AGENDA**

The agenda was adopted noting that agenda item 9. Trade Issues in the draft agenda would be 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 will be part of the report from the Management Committee for Cetaceans. 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/22/MC/3 summarising past proposals for conservation and management and responses to these
- NAMMCO/22/MC/4 summarising past requests to the Scientific Committee and responses.
- NAMMCO/22/SMC/5 listing recommendations to member countries in 2012.

New recommendations to member countries on scientific research arising and approved by the Management Committee for Seals and Walrus are contained in Appendix 3.

The vice-chair of the Scientific Committee, Tore Haug, presented the information on seal and walrus stocks from the Scientific Committee report (NAMMCO/22/5) under each species.

##### **4.1 Harp Seals**

##### **Status of specific recommendation to member countries agreed on in 2012**

In 2012 Norway and Greenland were recommended to limit the catches for the common stock between Norway and Russia for the White Sea/Barents Sea to 15 827 animals and for the Greenland Sea to 16 737 animals.

Greenland reported that harp seals are only hunted near the coast and that traditionally Norway has been granted permit to hunt off shore (EEZ).

Norway reported that in 2012 there had been 2 sealing vessels off the coast of East Greenland and the catch numbered 3 723 harp seals and in 2013 4 vessels had caught 15 939 animals.

Russia informed the meeting that there had been no catches in 2013.

##### **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 Scientific Committee examined the information provided by the ICES Working Group on Harp and Hooded Seals (WGHARP) which met in August 2013. The meeting focused on estimation of stock abundance and reviewed different catch level scenarios.

For the White Sea/Barents Sea stock a population model based on data and information used in previous assessments with harvest data updated to 2013, estimated a total harp seal stock abundance of 1 419 800 animals in 2013. Different catch levels had been investigated and the Scientific Committee considered the estimated equilibrium catches (17,400 1+ animals) to be the preferred option. It was noted that this option is slightly higher than the previous level given in 2012 and that this was probably the result of very low catches in 2012 and 2013. Data from the new survey conducted in 2013 was not ready for the WGHARP meeting and these will be dealt with at the next WGHARP meeting scheduled for November 2014.

For the Greenland Sea stock there is a new pup population estimate of 89 590 animals which is slightly, but not significantly lower than estimates from 2002 and 2007.

The stock is considered data rich (no data used in modelling are older than 5 years) and all model runs indicate a substantial increase in abundance from the 1970's with the 2013 abundance estimate of 627 410. Current catch level is predicted to give a 21% population increase over the next 10 years. Equilibrium catch level is 14 600 1+ animal. Catch level projecting a reduction is estimated to 21 270 1+ animals in 2014 and subsequent years. It was noted that any TAC should be subject to a monitoring scheme especially if the TAC is set at a level projecting a decline in population

For the Northwest Atlantic stock new pup population estimates (data from 2012 survey) from the Gulf of St Lawrence show a decline of nearly 50% compared to the 2008 estimates. However the survey data from the whole of the Northwest Atlantic was not ready and will be dealt with at the planned 2014 WGHARP meeting. Increasingly poor ice conditions and the year 2012 among the worst ever recorded, has serious implications for the persistence of breeding harp seals in the southern Gulf of St Lawrence.

The Scientific Committee advised that new requests to ICES from individual countries would be needed in order to finish assessments of White Sea and Northwest Atlantic harp seals. Preferably such requests should come from Russia and Greenland or Canada (Northwest Atlantic), respectively.

#### **Discussion and Conclusion**

The Management Committee took note of the report from the Scientific Committee. It was noted that the results from the surveys in 2013 had not been ready in time for the last WGHARP meeting, and as a result assessments of both the White Sea/Barents Sea and the Northwest Atlantic stocks was not finalised. In order to finalise these assessments Greenland agreed to send a new request to ICES on the Northwest Atlantic stock.

Russia informed the meeting that it was their intention to request ICES to assess the White Sea/Barents Sea.

#### **4.2 Hooded Seals**

##### **Status of specific recommendation to member countries agreed on in 2012**

In 2012 the Management Committee for Seals and Walrus reiterated the recommendation that catches of hooded seals to be taken from the Greenland Sea should be zero, except for local catches in East Greenland.

Both Norway and Greenland reported that the advice had been followed. In Greenland only near coast catches in East Greenland and no off shore catches have taken place and Norway had only taken a small number of animals for scientific reasons.

#### **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.

#### **Advice from the Scientific Committee**

The Greenland Sea stock, protected since 2007, is considered data poor. However a harp seal survey conducted in 2012 also obtained enough data to estimate the pup production of hooded seals to 13 655 pups which are slightly lower than from 2005 and 2007 surveys. The stock has experienced a decline in abundance from 1946 and is now considered to be at a level below 30% of the 1946-level. Recent model runs indicate a current population size of approximately 83 000 and a predicted 7% decrease of the 1+ population over the next 10 years. In line with the Precautionary harvest strategy developed by WGHARP the Scientific Committee recommends no current catches from the population.

#### **Discussion and conclusion**

Greenland informed the meeting that they hunt approximately 200 animals annually.

The Management Committee took note of the report from the Scientific Committee and recommends a commercial catch level of zero for this stock, only allowing limited research catches.

Greenland noted with reference to both harp and hooded seals that they had previously sent a request to ICES to look into the redistribution of animals throughout the year. ICES responded at that time that there was not enough data available to answer the question.

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.

### **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**

Currently the existing information on stock structure and size is not sufficient to give any answers to the requests. It may be fruitful to form a Working Group in the next few years (2015 or later) to look into movements versus where catches are occurring in relation to stock structure. It might also be important to assess this species in light of climate change and changing ice conditions. The Scientific Committee suggests to look into the results from the Arctic Council meeting (2013) on ring seals before making a final decision regarding a WG.

#### **Discussion and conclusions**

Greenland informed the meeting that the annual catches had declined over the last 10 years from around 90 000 animals to around 60 000 in 2012.

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.

### **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**

An age-structured population dynamics model had been developed to assess the Norwegian grey seal population. Model runs indicated an increase in the abundance of the total Norwegian grey seal population during the last 30 years, suggesting a total of 8,740 animals in 2011. A total catch of 707 grey seals would maintain the population size at the 2011 level. Norway has decided not to use the model based TAC, but instead continue to use the more conservative 5% of current abundance until a new pup production estimate becomes available. There are plans for a new complete survey in 2013-2015 and Norway and Russia plan a joint Southern Barents Sea survey in 2014 or later.

#### **Iceland**

Aerial survey estimates of pup production in Iceland, have indicated a downward trend in the period 1980 – 2004. A new survey in 2012 confirmed a status-quo in the low pup-production reached in the year 2002. The population size of the Icelandic grey seal is therefore staying at the low level reached in 2002 (about 4,200 animals) and just above the minimum population management objective of the Icelandic government, 4,100 1+ animals.

#### **Faroe Islands**

There is still no abundance estimate available. Preliminary data for 2012 indicate that the total removal is in excess of one hundred animals. Satellite tracking has shown that grey seal movements in the Faroes are very local, although there is documentation of seals migrating from UK waters to the Faroes.

There was no new information from Greenland.

The Scientific Committee recommends that the Working Group on Grey and Harbour Seals meet in 2014/2015 to finalise requests 2.4.2 and 2.5.2. The WG should assess the status of all populations, particularly using new abundance estimate data that are available from Iceland and Norway. The meeting should also address by-catch issues (grey seals) in Norway, Iceland, and the Faroe Islands, and a re-evaluation of the Norwegian management plans (implemented in 2011) for grey and harbour seals. It is recommended to include participation from Canada, UK and the Baltic countries.

### **Discussion and conclusions**

The Faroe Islands informed the meeting that they have initiated work to get fish farmers to report their catches. The reporting is still not satisfactory but it is expected to provide reliable removal numbers by 2014. By-catch in the Faroes is insignificant.

Iceland reported that reduced gill net cod fishery and tighter limits on operating days in the lumpsucker net fishery should have led to decreased by-catches. There has been no progress in by-catch reporting.

Greenland has no catches of grey seals as this species has been protected from hunting since 2010, as this is a new species in this area.

Norway informed the meeting that 64 grey seals were taken in 2012 and that the preliminary catches in 2013 are 177.

The Management Committee took note of the report from the Scientific Committee and endorsed that the Working Group on Grey and Harbour Seals meet in 2014/2015 in order to finalise requests 2.4.2 and 2.5.2.

## **4.5 Harbour Seals**

### **Status of specific recommendation to member countries agreed on in 2012**

In 2012 the Management Committee for Seals and Walruses reiterated its recommendation to obtain updated information on abundance and struck and lost figures. In the case of struck and lost data it recommended that a struck and lost factor be developed.

Norway informed the meeting that the latest abundance estimates are very close to the target level of the Norwegian Management plan. With respect to a struck and lost factor there is not data available to develop such a factor.

Greenland informed the meeting that harbour seals have been protected since 2010. There may be some by catch or mix up with ring seals and there are no data reported on struck and lost.

**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**

Aerial surveys in 2011 - 2013 yielded a new minimum point estimate of 7 081 for the entire Norwegian coast and this is implemented in the 2014 management following the plan reviewed by the Scientific Committee in 2011.

Aerial surveys in Svalbard gave corrected total estimates of 1 888 in 2009 and 1 742 and 1 812 in 2010 (two surveys). The low population size, limited spatial distribution and reduced genetic diversity make this population vulnerable to chance events, such as disease epidemics.

The Scientific Committee recommends that the Working Group on Grey and Harbour Seals meet in 2014/2015 to assess the status of all populations, particularly using new abundance estimate data that are available from Iceland and Norway, see agenda item 4.4 Grey seals.

**Conclusion**

The Management Committee took note of the report from the Scientific Committee and endorsed that the Working Group on Grey and Harbour Seals meet in 2014/2015 in order to finalise requests 2.4.2 and 2.5.2.

**4.6 Bearded seal**

**Status of past proposals for Conservation and Management**

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

**Status of specific recommendation to member countries agreed on in 2012**

In 2012 the Management Committee for Seals and Walruses reiterated its recommendation that efforts be renewed towards gathering information on biology, abundance and stock status with the view to an assessment.

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.

**Conclusion**

Norway informed the meeting that there is no hunt on this species and that there are plans for a research project by the Norwegian Polar Institute given that funding is available.

Greenland informed the meeting that approximately 1 300 animals are caught annual and that there has been a declining trend.

The Management Committee took note of the update from the Scientific Committee.

**4.7 Walrus**

**Status of past proposals for Conservation and Management**

In 2010 the Management Committee agreed that a common management regime should be established between Greenland and Canada on shared stocks of walruses (NAMMCO 19).

Greenland informed the meeting that no initiative has been taken towards Canada to cooperate on management of walrus because Greenland wants to manage this species in NAMMCO. Under the JCNB cooperation exchange of information takes place.

**Requests by Council for advice from the Scientific Committee**

**R2.6.5 – NAMMCO/17-2008:** provide assessment of all walrus stocks utilised in Greenland.

**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.

**R-2.6.6 – NAMMCO/21-2012):** investigate the possibility to include a carry-over for quotas in order to include this possibility in the next hearing for the new quota block period.

**Advice from the Scientific Committee**

The Working Group on walrus met in November 2013 to update assessment and to provide management advice for the three stocks of walrus that occur in Greenland.

The Baffin Bay stock is estimated to 1 430 animals with a sustainable harvest of no more than 93 animals. There has been a decline in the population from 1960s to 2007 while decreased catches subsequently have allowed the population to increase.

The West Greenland / Baffin Island stock is estimated to 2 630 animals with a sustainable harvest of no more than 100 animals. There has been a decline in population from 4000 animals in 1960 to 2 360 in 2007, while decreased catches subsequently have allowed the population to increase.

The East Greenland stock is estimated to 1 400 animals with sustainable harvest levels of no more than 20 animals.

The WG's assessment included a low and a high catch history that includes struck and lost. This results in an average loss rate about 15% for Baffin Bay and West Greenland/Baffin Island, and about 11% for East Greenland. Complete statistics on total removal levels is critical and the Scientific Committee recommended that Greenland obtains reliable reports of all animals struck and lost.

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

The Scientific Committee recommended that Greenland 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.
- That regular abundance estimates (5-10 years) from Baffin Bay, West Greenland, and the southeast coast of Baffin Island are obtained.

**Other information**

In a walrus survey of Svalbard completed in 2012 an increase in both total numbers and females with calves compared with the 2006 survey is apparent. The study on disturbance at haulouts using cameras continues. Funding has been acquired for a 2014 tagging project that aims to investigate how individuals are responding to changes in ice conditions. The recent estimate is 2 600 animals, and the struck structure is unresolved.

Greenland plans to conduct an aerial survey of walruses on the ice edge in the North Water in April 2014. There is a new study of walrus in the Pechora Sea related to oil and gas exploration and extraction.

Iceland noted that there have been a higher than usual number of visits from walruses in 2013.

Greenland informed the meeting that they have follow the quota recommendations from NAMMCO. In 2013 a political decision was made to increase the quota with 10 animals in the Qaanaaq area. The preliminary numbers for 2013 are in Nordlandet: quota 62, catch 65 and western Greenland 60 and 47 respectively. Struck and lost will be a focus area in the future and discussions are underway with the Greenland Nature Institute on how to proceed with this.

Greenland informed the meeting that there will be no accumulation over years of carry-over quotas. Only unused quota from the previous year will be allowed to transfer.

### **Conclusion**

The Management Committee took note of the report from the Scientific Committee. The Management Committee furthermore noted there were recommendations for further research addressed to Greenland. It also noted that Greenland had taken steps to obtain reports of all animals struck and lost, and endorsed this effort.

The Management Committee also noted that the Scientific Committee had given their advice on request R 2.6.6 and that this request was now finalised.

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

The dispute concerns regulations of the European Union (EU) that generally prohibit the importing and marketing of seal products. The EU Seal Regime provides for various exceptions to the prohibition if certain conditions are met, including seal products derived from hunts conducted by Inuit or indigenous communities (IC exception) and hunts conducted for marine resource management purposes (MRM exception).

Products derived from the Greenland Inuit hunt fulfils the requirements set up in the IC exception, and it is expected this will also be the case for the Canadian Inuit hunt. The Canadian and Norwegian hunts are not granted market access to the EU under the current seal regime.

Norway and Canada asked the WTO to establish a panel in the seal case on the 21<sup>st</sup> of April 2011. The first and second hearing of the panel took place in Geneva in February and April 2013.

The panel concluded that the IC exception and the MRM exception were inconsistent with the EUs obligations under the GATT agreement. The panel did not find the regulation to be inconsistent with art. 2.2 of the TBT agreement as the regulation, to a certain extent, fulfil the objective of addressing EU public moral concerns on seal welfare and that no other alternatives were demonstrated to make an equivalent or greater contribution.

24 January 2014 Norway and Canada notified the Dispute Settlement Body (DSB) of the WTO of its decision to appeal the panel's findings, and 29 January 2014 the EU notified the DSB of its decision to appeal other parts of the panel's findings. The hearing will take place 17 - 19 March, and it is expected that the appellate body's report will be published in April/May 2014.

Norway reported that it believes that the EU Seal Regulation is incompatible with the EU's international obligations under the WTO Agreement. The sealing industry in Norway is of limited economic value, but this is a matter of principle concerning market access for renewable marine resources. The aim of taking the matter to the WTO is to obtain an objective and impartial review of the regulation. The DSB concluded that the EUs seal regulation violates WTO rules concerning non-discrimination. The panel did not conclude that the regulation is more trade restrictive than necessary. Based on this, Norway filed a notice of appeal regarding the panel's report. Norway believes the dispute can be resolved through the introduction of a labeling scheme for seal products, enabling the consumers to decide whether or not to purchase the product. Norway also finds that the panel has not sufficient considered that the seal stocks hunted are properly managed and not threatened. Furthermore, the Norwegian seal hunt is strictly controlled and regulated in terms of animal welfare requirements.

Greenland underlined that this issue of trade barriers goes back to the 1970s and has since resurfaced and been discussed on various arenas and bodies. Seals and marine mammal hunting are often divided into two major categories – subsistence versus commercial. Greenland has always been opposed to this notion as it undermines the idea of people's right to utilize their natural resources. Greenland's special situation, not being part of EU but at the same time being part of the Kingdom of Denmark, poses certain restrictions and limitation for Greenland to be an active part in the negotiations. Greenland has voluntarily given comments to submissions on factual input to Norway, Canada and the EU. The parties have chosen not to use the corrections from Greenland with the argument that the corrections would diminish their arguments.

The representative from KNAPK gave an intervention informing on the ongoing campaign *Inuit Sila* the organization has staged in response to the EU regulation. He underlined that the regulation is a clear violation of the WTO's overall objectives, and the result is that the market for sealskins is destroyed and this is seriously threatening the identity and existence of Greenland's 60 settlements.

Iceland reported that they strongly support Canada and Norway, and that they had submitted an appeal as a third party to the WTO Panel's Report in the long-standing dispute. In Iceland's third-party submission it subscribes to the legal and factual arguments put forward both by Canada and Norway in their appeal.

Canada gave an update on their position and stated that once a ruling is finalized, if a measure is found to be inconsistent with trade obligations, the country must comply with ruling or face retaliatory measures.

The Canadian arguments for appeal are that the decision by the Panel is based on misinformation and did not fully take into account all of the evidence, e.g. the distinction between seal and other hunts are based on insufficient evidence. Canada remains concerned about the use of the public morality rationale as a justification for maintaining the EU ban as it could have broader implications for other resource-based and agricultural sectors. Lastly Canada noted that the EU seal regime restricts trade more than necessary.

The Faroes expressed their sympathy and respect of the Greenlandic situation and underlined that recognition or authorization of hunting practices in general should not be restricted to any predefined ethnicity or culture.

Denmark reported that they fully support Greenland and that it has been decided not to go into the dispute. Denmark is awaiting the final outcome before deciding on the next steps.

## **6. TO 9. JOINT SESSION<sup>5</sup>**

### **10. ELECTIONS**

The present chair and vice-chair were re-elected for a new 2 year term (2014 – 2016).

Chair: Hild Ynnesdal (Norway)

Vice-Chair: Iceland

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<sup>5</sup> Agenda points 6. to 9. are in a joint session with the Management Committee for Cetaceans in Section 2.1



## **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. TRADE ISSUES AND THE EU BAN OF IMPORT OF SEALSKIN**

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

**7. ECOSYSTEM-BASED MANAGEMENT**

**8. USER KNOWLEDGE IN MANAGEMENT DECISION-MAKING**

**9. RELATED MANAGEMENT ISSUES**

**9.1 Marine mammal - fisheries interactions**

**9.2 Environmental questions**

**9.3 By-catch data and monitoring**

**9.4 Other topics**

**10. ELECTIONS**

**11. ANY OTHER BUSINESS**

**Agenda Items 6. – 9. incl.** were discussed in a joint session with the Management Committee for Cetaceans.

**LIST OF DOCUMENTS**

| <b>Document no</b>      | <b>Title</b>   | <b>Agenda item</b> |
|-------------------------|--|--------------------|
| NAMMCO/20/SMC/1         | List of Documents  |                    |
| NAMMCO/20/SMC/2         | Draft Agenda   | 2.                 |
| NAMMCO/20/MC/3          | <b>Status of Past Proposals for Conservation and Management</b>  | 4., 6., 7. and 8.  |
| NAMMCO/20/MC/4          | Summary of Requests by NAMMCO Council to the Scientific Committee, and Responses by the Scientific Committee | 4.                 |
| NAMMCO/20/SMC/5         | Recommendations to member countries 2012   | 4. and 8.          |
| NAMMCO/20/5 and ANNEX 2 | Report of the Twentieth Meeting of the Scientific Committee  | 4., 5., 6., and 8. |

## **RECOMMENDATIONS TO MEMBER COUNTRIES 2014**

### **Harp seals**

#### ***Greenland***

Greenland agreed to send a new request to ICES in order to finalise 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.

### **Hooded seals**

#### ***Norway, Greenland***

The Greenland Sea Stock: recommends a commercial catch level of zero only allowing limited research catches.

### **Walrus**

#### ***Greenland***

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.
- That regular abundance estimates (5-10 years) from Baffin Bay, West Greenland, and the southeast coast of Baffin Island are obtained.

### ANNEX 1: STATUS OF PAST 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. See List of References for sources of meeting documents. 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   |
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| <b>1.1.0</b> | <b>Incorporation of the users' knowledge in the deliberations of the Scientific Committee</b>   |  |
| 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        | <p>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 <b>recommended</b> 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).</p> <p>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</p> |  |

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|              | 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).  |  |
| <b>1.2.0</b> | <b>Marine mammal – fisheries interactions</b>  |  |
| 1.2.1        | <p>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).</p> | <p>The Management Committees <b>expressed</b> a general support for the modelling exercise proposed and <b>recommended</b> the Secretariat and the Scientific Committee to continue the planning. The four modelling approaches proposed are:</p> <ol style="list-style-type: none"> <li>1. Minimal realistic model implemented using GADGET</li> <li>2. Ecopath with Ecosim</li> <li>3. Time series regression</li> <li>4. A simple biomass-based model such as one recently applied in eastern Canada.</li> </ol> <p>Potential candidates have been identified to undertake the work.</p> <p>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.</p> <p>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).</p> |
| <b>1.3.0</b> | <b>By-catch</b>  |  |
| 1.3.1        | <p><i>Norway:</i></p> <p>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</p>  | Norway reported that it has a reference fleet as a trial for by-catch reporting. It is hoped that data will be available and   |

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|      | <p>of by-catch from fisheries to NAMMCO as soon as they become available (NAMMCO/16).</p> <p><i>Faroes:</i><br/>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).</p> <p><i>Iceland:</i><br/>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).</p> <p>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).</p> <p>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).</p> | <p>analysed at the end of 2009. The findings should be available for reporting next year (NAMMCO 18).</p> <p>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).</p> <p>In Iceland there had been progress in monitoring but no results as yet (NAMMCO 18).</p> <p>There was still uncertainty whether by-catch in Greenland was reported as such or as catch (NAMMCO 18).</p> <p>The Management Committees <b>noted</b> the work undertaken by the Scientific Committee for organising a joint workshop with ICES, focussing on by-catch monitoring systems and reviewing the advantages and disadvantages of existing observation schemes for marine mammals, and <b>recommended</b> moving forward on this matter (NAMMCO 18).</p> <p>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).</p> <p>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).</p> |

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|              |  | <p>The Faroe Islands reported that a new electronic logbook system for vessels larger than 15 BRT is being developed and should be 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).</p> <p>Greenland reported that by-catches are reported as catches but a revised reporting system allowing discrimination of origin is underway (NAMMCO 19).</p> |
| <b>1.4.0</b> | <b>Joint NAMMCO control scheme</b>   |  |
| 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.  |
| <b>1.5.0</b> | <b>Enhancing ecosystem-based management</b>  |  |
| 1.5.1        | <p>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).</p> <p>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).</p> <p>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 <i>ad hoc</i> Working Group on ecosystem-based management. Discussions</p> |  |



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|              | <p>of a general nature on the management level in recent years had been useful, and the efforts of the members of the <i>ad hoc</i> 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 general terms and to review how other relevant international bodies are addressing both the concepts and the practicalities of ecosystem-based management (NAMMCO 17).</p>   |   |
| <b>2.1.0</b> | <b>Harp seals</b>   |   |
| 2.1.1        | <p>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</p> <p>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).</p>   | <p>Greenland informed that a new executive order on seals will come into force in 2010 (NAMMCO 18).</p>   |
| 2.1.2        | <p><i>Northwest Atlantic</i></p> <p>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.</p> <p>The Management Committee <u>concluded</u> 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).</p> <p>The Management Committee <u>noted</u> 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).</p> | <p>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: <a href="http://www.dfo-mpo.gc.ca/seal-phoque/reports/index.htm">http://www.dfo-mpo.gc.ca/seal-phoque/reports/index.htm</a>. 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).</p> <p>Greenland commented that sustainable catches may be obtained at other catch levels than those that provide replacement yields. (NAMMCO/11).</p> |

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|       | <p>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 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).</p> <p>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).</p> | <p>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 population well above the conservation reference points adopted (NAMMCO/12).</p> <p>Greenland informed the Management Committee that bilateral discussions with Canada on the Canadian Management Plan had taken place over the past year (NAMMCO/13).</p> <p>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).</p> |
| 2.1.3 | <p><i>North Atlantic, White/Barents Sea</i></p> <p>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).</p>   | <p>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).</p>   |
| 2.1.4 | <p><i>Greenland Sea</i></p> <p>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</p>   | <p>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</p>  |

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|              | levels approaching the replacement yield are advised. (NAMMCO/6).  | <p>the take of seals from this stock (NAMMCO/13).</p> <p>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).</p> |
| 2.1.5        | <p>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 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).</p> <p>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).</p> |  |
| 2.1.6        | The Management Committee also <b>endorsed</b> 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).   |  |
| <b>2.2.0</b> | <b>Hooded seals</b>  |  |
| 2.2.1        | <p><i>Northwest Atlantic</i></p> <p>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 <u>concluded</u> that present catches of hooded seals in the Northwest Atlantic (1990-</p>   |  |

| CODE         | PROPOSAL FOR CONSERVATION AND MANAGEMENT  | MANAGEMENT MEASURES/RESPONSE BY MEMBER COUNTRIES   |
|--------------|---|--|
|              | 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        | <i>Northwest Atlantic</i><br>The Management Committee <u>noted</u> 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        | <i>Greenland Sea</i><br>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). | <p>While supporting the past conclusion of the Management Committee 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).</p> <p>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).</p> <p>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).</p> <p>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).</p> |
| <b>2.3.0</b> | <b>Ringed seals</b>   |  |
| 2.3.1        | The Management Committee noted the conclusions of the Scientific Committee on   |  |

| CODE         | PROPOSAL FOR CONSERVATION AND MANAGEMENT  | MANAGEMENT MEASURES/RESPONSE BY MEMBER COUNTRIES   |
|--------------|---|--|
|              | 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 <u>endorsed</u> the Scientific Committee's conclusions that present removals of ringed seals in Area 1 can be considered sustainable (NAMMCO/6).   | The Greenland 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).  |
| <b>2.4.0</b> | <b>Grey seals</b>   |  |
| 2.4.1        | <p>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.</p> <p>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.</p> <p>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).</p> | <p>Iceland reported that 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 to this objective will be careful monitoring of the stock size.</p> <p>Norway reported that a management plan for grey seals is presently under development. Recent catches have been lower than the quota levels in most areas (NAMMCO/14).</p> <p>Norway reported that a management plan for grey seals is still under development. Recent catches have been lower than the quota levels in most areas. 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).</p> <p>The Faroe Islands noted that 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).</p> <p>The Faroes reported that there would be a satellite tracking</p> |

| CODE | PROPOSAL FOR CONSERVATION AND MANAGEMENT   | MANAGEMENT MEASURES/RESPONSE BY MEMBER COUNTRIES  |
|------|--|---|
|      | <p>The Management Committee recommended Greenland to protect grey seals from hunting given the likely isolation of the small stock in southeast Greenland (NAMMCO 19).</p> | <p>programme for grey seals starting in the spring of 2007 with a view to further studies on feeding ecology and abundance. This information was welcomed by the Committee (NAMMCO/16).</p> <p>Norway informed that 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).</p> <p>Norway reported that national management plans are presently ready to be fully implemented for both grey and harbour seals (NAMMCO 19).</p> <p>Greenland reported that the recommendation of a total ban on hunting of grey seals has already been incorporated in a new Executive Order (NAMMCO 19).</p> <p>A ban on the hunting of grey seals in Greenland was implemented from 1 December 2010 as a new Executive Order. (NAMMCO 20).</p> <p>A management plan for grey seals was implemented in Norway in late autumn 2010, coming into effect from January 1 2011, aiming at ensuring sustainable and viable populations of this species within its natural distribution. The Ministry of Fisheries and Coastal Affairs has decided to stabilize the grey seal population at a Target Level (TL) equal to 1,200 pups born annually. Hunting quotas are used to stabilize the populations at the TL, and measures should be designed to ensure the greatest impact in areas where there is documented significant damage to the fishing industry from seals. (NAMMCO 20).</p> |

| CODE  | PROPOSAL FOR CONSERVATION AND MANAGEMENT  | MANAGEMENT MEASURES/RESPONSE BY MEMBER COUNTRIES   |
|-------|---|--|
|       |   | <p>Grey seals are managed within 3 management units (Northern, Central and Southern Norway) based on pupping time and genetic differences. Hunting quotas are set for 5-year periods, so that it will be possible to adjust the removals in relation to new population estimates, new knowledge about the damage to the fishing industry, new environmental threats, etc. (NAMMCO 20).</p>   |
| 2.4.2 | <p>With regards to the present estimate of a harvest up til 40% of the population annually, the Scientific Committee <b>urged</b> the Faroe Islands to estimate their present removals and abundance off their coast. The Scientific Committee <b>strongly recommended</b> that all efforts be made in providing a proper estimate of population size and catch at its next meeting (NAMMCO 18).</p> <p>The Scientific Committee also <b>recommended</b> 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).</p> <p>The Management Committee for Seals and Walruses <b>noted</b> the considerations and all suggestions by the Scientific Committee and <b>recommended</b> 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 <b>supported</b> the recommendations concerning the compilation and reporting of Faroese removal and abundance data, and the Icelandic research data (NAMMCO 18).</p> <p>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 and catches for 2011 (NAMMCO 19).</p> | <p>The Faroese reported that efforts were being undertaken to obtain better information on population, removals and breeding sites for this species, and that satellite tagging of grey seals has been attempted and is in progress. Private companies possess data on this and other species. With regards to the present estimate of a harvest up til 40% of the population annually, the Scientific Committee <b>urged</b> the Faroe Islands to estimate their present removals and abundance off their coast. The Scientific Committee <b>strongly recommended</b> that all efforts be made in providing a proper estimate of population size and catch at its next meeting (NAMMCO 18).</p> <p>The Scientific Committee also <b>recommended</b> 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).</p> <p>The Management Committee for Seals and Walruses <b>noted</b> the considerations and all suggestions by the Scientific Committee and <b>recommended</b> 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 <b>supported</b> the recommendations concerning the compilation and reporting of Faroese removal and abundance data, and the Icelandic research data (NAMMCO 18). (NAMMCO 17).</p> |

| CODE         | PROPOSAL FOR CONSERVATION AND MANAGEMENT  | MANAGEMENT MEASURES/RESPONSE BY MEMBER COUNTRIES  |
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|              |   | Iceland reported that 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).   |
| <b>2.5.0</b> | <b>Harbour seals</b>  |   |
| 2.5.1        | <p>The Committee noted a request from NAMMCO 16: to define management objectives for harbour seals in Norway, Iceland and Greenland (NAMMCO 17).</p> <p>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).</p> <p>The Management Committee reiterated a recommendation for a formal assessment of the Icelandic stock and the establishment of clear management objectives (NAMMCO 18).</p> | <p>Norway is currently working on a management plan for harbour seals (NAMMCO/16).</p> <p>The Faroe Islands took note of the SC report and recommendations but have no priority for a specific management plan at this time because the species no longer occurs in the Faroes (NAMMCO/16).</p> <p>Greenland is working on management plans for a number of species, including harbour seal. Until now work has focused on polar bears, walrus, narwhal and beluga. However, the next priority will be given to harbour seals. Reported catches have been very high, probably due to misreporting. Greenland has moved harbour seal to a different place on the list used to report catches, and only a catch of 24 was reported for 2006 (NAMMCO/16).</p> <p>Greenland informed that a draft of an 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).</p> <p>Total protection of harbour seals had been implemented in Greenland from 1 December 2010.</p> <p>Iceland reported that management objectives for harbour seals had been set to maintain the stock close to the 2006 level (NAMMCO 19).</p> |



| CODE         | PROPOSAL FOR CONSERVATION AND MANAGEMENT   | MANAGEMENT MEASURES/RESPONSE BY MEMBER COUNTRIES   |
|--------------|--|--|
|              | <p>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 depth evaluation of the plan, including a comparison with existing management models for e.g. harp and hooded seals (NAMMCO 18).</p>  | <p>In Iceland, new abundance estimates are available, but there is still insufficient information on by-catch. 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).</p> <p>Norway reported that national management plans are presently ready to be fully implemented for both grey and harbor seals (NAMMCO 19).</p> <p>It was noted that a management plan for both grey and harbour seals had been implemented in Norway in late autumn 2010. (NAMMCO 20).</p> |
| <b>2.6.0</b> | <b>Atlantic walruses</b>   |  |
| 2.6.1        | <p>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.</p> <p>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 <u>recommends</u> that Greenland take appropriate steps to arrest the decline of walrus along its west coast.</p> <p>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</p> | <p>Greenland provided the Management Committee with information on further measures recently implemented through legislation by the Greenland authorities for the conservation of the West Greenland stock. These regulations include: the restriction of walrus hunting to people with valid professional hunting licences only; a year-round ban on walrus hunting south of 66° N; limitations on the means of transport used in connection with walrus hunting to dog sleds and vessels of 19.99 GRT/31.99 GT or less; and the sale of walrus products limited to direct sales at open markets or for personal use only. Municipal authorities now also have the possibility of implementing further restrictions if circumstances require.</p>                                   |

| CODE  | PROPOSAL FOR CONSERVATION AND MANAGEMENT   | MANAGEMENT MEASURES/RESPONSE BY MEMBER COUNTRIES  |
|-------|--|---|
|       | <p>shared, the Management Committee encourages Canada to consider working co-operatively with Greenland to assist in the achievement of these objectives (<i>NAMMCO Annual Report 1995</i>: 49).</p> | <p>(NAMMCO/8).</p> <p>Greenland noted that in addition to the regulatory measures that were taken in 1999, it had been decided to introduce quotas on walrus. A new regulatory proposal has been drafted and public hearings will be held in the near future. The final regulatory proposal will take these hearings into account. (NAMMCO/11).</p> <p>Greenland informed the Committee that 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).</p> <p>Greenland informed the Committee that a regulatory initiative that will restrict walrus hunting to those holding valid hunting licences, and allow the introduction quotas and other hunting regulations for this species was now in progress, and that public hearings were being conducted. The regulation will go to the Greenlandic government for approval this year (NAMMCO/13).</p> <p>Greenland announced that they plan introducing quotas for walrus, possibly in 2005. Greenland is awaiting the findings of the Scientific Committee in their assessment of walrus. (NAMMCO/14).</p> <p>Greenland noted that the planned regulatory initiative had been delayed but was expected to be introduced in 2006 (NAMMCO/15).</p> |
| 2.6.2 | <p>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</p>                             | <p>Greenland had made considerable progress in this area of assessment through implementation of hunting regulations and</p>  |

| CODE         | PROPOSAL FOR CONSERVATION AND MANAGEMENT   | MANAGEMENT MEASURES/RESPONSE BY MEMBER COUNTRIES   |
|--------------|--|--|
|              | <p>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).</p> <p>The Management Committee agreed that the relationship between JCNB and NAMMCO regarding walrus would be revisited next year. (NAMMCO/16).</p> <p>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).</p> <p>The Management Committee also agreed that managers should consider establishing a more robust system for monitoring the sex and age composition of the catch (NAMMCO 19).</p> <p>The Management Committee agreed that a common management regime should be established between Greenland and Canada on shared stocks of walruses (NAMMCO 19).</p> | <p>the Greenland Institute for Natural Resources (GINR) developing a Research Plan for 2007-10 (NAMMCO/16).</p> <p>Greenland informed that quotas and other regulations had been introduced under a new Executive Order, finalised in 2006. Thereafter, the government introduced 3-year quotas for the period 2007 – 2009. The approved 3-year quotas are 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).</p> <p>Greenland explained that the JCNB dealt originally with narwhal and beluga, and deals now also with walrus. NAMMCO has agreed that JCNB gives management advice for stocks of narwhal and beluga in West Greenland. A similar agreement could be reached about walrus. However, the interaction between JCNB and NAMMCO regarding management advice for walrus should be addressed. (NAMMCO/16).</p> |
| <b>2.7.0</b> | <b>Bearded seal</b>  |  |
|              | <p>The Management Committee <b>recommended</b> that the status of this species be assessed (NAMMCO 18).</p>  |  |

| CODE         | PROPOSAL FOR CONSERVATION AND MANAGEMENT  | MANAGEMENT MEASURES/RESPONSE BY MEMBER COUNTRIES |
|--------------|---|--|
| <b>3.1.0</b> | <b>North Atlantic fin whales</b>  |  |
| 3.1.1        | <p><i>East Greenland-Iceland Stock</i></p> <p>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 surveys. Furthermore, the Management Committee stressed that the utilization of this stock should be followed by regular monitoring of the trend in the stock size.</p> <p>The Management Committee also noted the conservative nature of the advice from the Scientific Committee on which the conclusion of the Management Committee was based (NAMMCO/9).</p>  |  |
| 3.1.2        | <p><i>East Greenland-Iceland Stock</i></p> <p>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>i.e.</i> 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).</p> <p>In 2007 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).</p> <p>The Management Committee noted that it had previously asked that the Scientific Committee continue with its assessments of fin whale stocks in the areas of interest to NAMMCO countries with existing and new information on abundance and stock delineation as it becomes available, and endorsed the plan of the Scientific Committee to complete an assessment for the Northeast Atlantic stocks as a next step</p> |  |

| CODE         | PROPOSAL FOR CONSERVATION AND MANAGEMENT   | MANAGEMENT MEASURES/RESPONSE BY MEMBER COUNTRIES |
|--------------|--|--|
|              | <p>in this process (NAMMCO/16).</p> <p>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).</p>  |  |
| 3.1.3        | <p><i>Faroe Islands</i></p> <p>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).</p>   |  |
| <b>3.2.0</b> | <b>Minke Whales - Central North Atlantic</b>   |  |
| 3.2.1        | <p>The Management Committee <u>accepted</u> 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).</p>   |  |
| 3.2.2        | <p>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).</p> <p>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</p> |  |

| CODE         | PROPOSAL FOR CONSERVATION AND MANAGEMENT  | MANAGEMENT MEASURES/RESPONSE BY MEMBER COUNTRIES   |
|--------------|---|--|
|              | <p>years. This catch level refers to total removals from the CIC or CMA, both Icelandic and others (NAMMCO 18).</p> <p>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).</p> <p>The Management Committee endorsed the new abundance estimates and concluded that annual removals of up to 229 minke whales from the CIC area (Central Icelandic Coastal) are safe and precautionary at least for the period 2011 – 2016. (NAMMCO 20).</p> |  |
|              | <b>- West Greenland</b>   |  |
| 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).   |
| <b>3.3.0</b> | <b>Narwhal - West Greenland</b>   |  |
| 3.3.1        | <p><i>Avanersuaq</i><br/>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</p> <p><i>Melville Bay – Upernavik</i><br/>The Management Committee noted that the Scientific Committee could give no status for the Melville Bay – Upernavik summering stock.</p> <p><i>Uummannaq</i><br/>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</p>  | <p>As for beluga, harvest quotas will be introduced for West Greenland narwhal in the near future (NAMMCO/11).</p> <p>Greenland informed the Committee that 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).</p> |

| CODE  | PROPOSAL FOR CONSERVATION AND MANAGEMENT  | MANAGEMENT MEASURES/RESPONSE BY MEMBER COUNTRIES  |
|-------|---|---|
|       | <p>estimated.</p> <p><i>Disko Bay</i><br/>The Management Committee noted that present catches in this area are probably sustainable.</p> <p><i>Catch Statistics</i><br/>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).</p>  |   |
| 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 informed the Committee that the new regulations mentioned under 5.8 for 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 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). | <p>Greenland informed the Committee that quotas of 200 in West Greenland and 100 in Qaanaaq had been introduced in 2004. After implementation the catch was lower than the quota level (NAMMCO/14).</p> <p>Greenland noted that a quota system for narwhal had been introduced in 2004, and the quota for 1 July 2004 to 30 June 2005 of 300 had been nearly fully taken. The quota for 2005/2006 of 260 had been 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).</p> |
| 3.3.4 | <p>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.</p> <p>It is apparent that there continues to be considerable disagreement between scientists</p>  |   |

| CODE | PROPOSAL FOR CONSERVATION AND MANAGEMENT   | MANAGEMENT MEASURES/RESPONSE BY MEMBER COUNTRIES   |
|------|--|--|
|      | <p>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.</p> <p>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.</p> <p>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).</p> <p>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).</p> <p>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</p> | <p>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</p> |



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|              | 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).   | <p>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.</p> <p>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).</p> |
| 3.3.5        | <p>The Management Committee for Cetaceans <b>noted</b> 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).</p> <p>The Management Committee for Cetaceans, based on advice from the Scientific Committee, <b>recommended</b> 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 <b>total removals</b> of 310 and 85 narwhals in West and East Greenland respectively (NAMMCO 18).</p> | <p>The Management Committee <b>noted</b> 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).</p> <p>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).</p>  |
| 3.3.6        | The Management Committee strongly <b>recommends</b> 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).   |   |
| <b>3.4.0</b> | <b>Beluga - West Greenland</b>  |   |
| 3.4.1        | <p><i>Maniitsoq – Disko</i></p> <p>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.</p>   | <p>Greenland stated that this issue again will be thoroughly discussed with the hunters, and that the Greenland Government does share the concerns expressed. (NAMMCO/10).</p> <p>Greenland informed the Committee that in November 2000 the</p>  |

| CODE  | PROPOSAL FOR CONSERVATION AND MANAGEMENT  | MANAGEMENT MEASURES/RESPONSE BY MEMBER COUNTRIES   |
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|       | <p><i>Avanersuaq – Upernavik</i></p> <p>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.</p> <p>Finally the Management Committee noted the conclusion by the Scientific Committee that with the observed decline a reduction in harvesting in both areas seems necessary to halt or reverse the trend (NAMMCO/9).</p>   | <p>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).</p> <p>Greenland informed the Committee that 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).</p>  |
| 3.4.2 | <p>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. The Management Committee therefore <u>recommended</u> that closer links be developed between NAMMCO and the JCNB on this and other issues of mutual concern. (NAMMCO/10).</p>  |  |
| 3.4.3 | <p>In 2000 the Management Committee accepted that the JCNB would provide management advice for this stock, which is shared by Canada and Greenland. The Management Committee noted with pleasure that 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, and recommended that this co-operation at the scientific level should continue. The Management Committee also reiterated its recommendation that closer links be developed between NAMMCO and the JCNB on this and other issues of mutual concern. (NAMMCO/11).</p> | <p>Greenland informed the Committee that a regulatory framework allowing the government to set quotas and other limitations on hunting has now been passed. The new regulations provide protection for calves and females with calves and limit the size of vessels that are involved in beluga and narwhal hunting as well as hunting methods. The Municipalities will have the power to limit or prohibit the use of nets for narwhal/beluga harvesting. It is expected that quotas will be introduced for beluga and narwhal by July 2004. The municipalities will be involved in the allocation of the quotas (NAMMCO/13).</p> <p>Greenland informed the Committee that a quota of 320 had been introduced in West Greenland and Qaanaaq year-round from 1<sup>st</sup> July 2004. After implementation the catch was lower than the quota level, mainly due to poor weather conditions (NAMMCO/14).</p> |

| CODE  | PROPOSAL FOR CONSERVATION AND MANAGEMENT  | MANAGEMENT MEASURES/RESPONSE BY MEMBER COUNTRIES   |
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|       |   | Greenland noted that a quota system for beluga had been introduced in 2004, and 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 | <p>In 2005 the Scientific Committee provided similar advice to that given previously, that reducing catches to 100 per year will have an 80% chance of halting the decline in beluga numbers by 2010. Maintaining higher catches reduces the probability of halting the decline. This conclusion was reached in a joint meeting with the Canada/Greenland Joint Commission on Conservation and Management of Narwhal and Beluga (JCNB) Scientific Working Group, using the best scientific advice available. Similar advice was first provided in 2000 and has been confirmed and reiterated in meetings held in 2003 and 2004.</p> <p>It is apparent that there continues to be considerable disagreement between scientists and hunters on beluga 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 beluga in a precautionary manner in the face of uncertainty and apparently contradictory evidence. In this regard it was noted that the present quota of 200 was twice that recommended by the Scientific Committee.</p> <p>While commending Greenland for the recent introduction of quotas and reduction in the harvest, and recognising that the actual catch in 2004/2005 was within the level recommended, the Management Committee expressed serious concern that present quotas for beluga 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 reduction of the stock.</p> <p>In 2000 NAMMCO accepted that the 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 removal of belugas in West Greenland to sustainable levels (NAMMCO/15).</p> <p>In 2007 the Management Committee noted the concern of the Scientific Committee</p> |  |

| CODE         | PROPOSAL FOR CONSERVATION AND MANAGEMENT  | MANAGEMENT MEASURES/RESPONSE BY MEMBER COUNTRIES  |
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|              | <p>that the quota for West Greenland beluga remained above the recommended level of 100, at 140 annually. In this respect the conclusion of the JCNB from their meeting in 2006, that the population is depleted and that further action is required to halt the decline, was also noted. However it was also noted that the quota has been 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).</p> | <p>The Management Committee for Cetaceans welcomed the multi-annual catch quotas recently introduced by Greenland for beluga stocks and based on advice of the Scientific Committee that an annual take of 310 belugas over 5 years up to 2014 was sustainable, and <b>noted</b> 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).</p> |
| <b>3.5.0</b> | <b>Northern bottlenose whales</b>   |   |
| 3.5.1        | <p>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.</p> <p>The Management Committee <u>accepted</u> 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).</p>  |   |
| <b>3.6.0</b> | <b>Long-finned pilot whales</b>   |   |
| 3.6.1        | <p>The Management Committee noted the findings and conclusions of the Scientific Committee, through its review of the ICES Study Group Report and the analysis of data from NASS-95 with respect to the status of long-finned pilot whales in the North Atlantic (Section 3.1, item 3.1), which also confirmed that the best available abundance estimate of pilot whales in the Central and Northeast Atlantic is 778,000. With respect to stock identity it was noted 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</p>   | <p>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).</p> <p>The Faroe Islands reported that plans are underway to implement a monitoring programme, the aim of which is to</p>  |

| CODE         | PROPOSAL FOR CONSERVATION AND MANAGEMENT   | MANAGEMENT MEASURES/RESPONSE BY MEMBER COUNTRIES  |
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|              | <p>restricted to Faroese waters, had been ruled out.</p> <p>The Management Committee further noted the conclusions of the Scientific Committee 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%.</p> <p>Based on the comprehensive advice which had now been provided by the Scientific Committee to requests forwarded from the Council, the Management Committee <u>concluded</u> that the drive hunt of pilot whales in the Faroe Islands is sustainable (NAMMCO/7).</p> <p>In 2007, noting the comprehensive international scientific research sampling of all pilot whales caught in the Faroes from 1986 to 1988, the Management Committee underlined the value of building on and updating this valuable information by ensuring ongoing sampling of pilot whales in the Faroes (NAMMCO/16).</p>  | <p>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).</p> |
| <b>3.7.0</b> | <b>Humpback whales</b>   |   |
| 3.7.1        | <p>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).</p> <p>The Management Committee <b>noted</b> 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.</p> <p>The Management Committee <b>recommended</b> that the total quota of humpbacks in West Greenland in 2009, including by-catches, should not exceed 10 animals (NAMMCO 17; NAMMCO 18).</p> |   |

| CODE         | PROPOSAL FOR CONSERVATION AND MANAGEMENT   | MANAGEMENT MEASURES/RESPONSE BY MEMBER COUNTRIES  |
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|              | The Management Committee <b>recommended</b> that a total removal of up to 20 humpback whales per year 2010-2015 would be sustainable (NAMMCO/19).  |   |
| <b>3.8.0</b> | <b>Harbour porpoises</b>   |   |
| 3.8.1        | <p>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 catches are in the low thousands annually (NAMMCO/16).</p> | <p>The Management Committee <b>endorsed</b> 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.</p> <p>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.</p> <p>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.</p> <p>Norway reported that porpoise by-catch data will be available after validation of their by-catch monitoring programme (NAMMCO 17).</p> |
| <b>3.9.0</b> | <b>T-NASS</b>  |   |
| 3.9.1        | <p>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).</p> <p>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</p>                   | <p>Estimates from T-NASS 2007 surveys had allowed for the first time estimates of abundance for the following species in the whole North Atlantic:</p> <p>50,000 fin whales<br/>15,000 humpback whales<br/>150,000 minke whales (NAMMCO 19).</p>  |

| CODE         | PROPOSAL FOR CONSERVATION AND MANAGEMENT  | MANAGEMENT MEASURES/RESPONSE BY MEMBER COUNTRIES |
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|              | areas (NAMMCO 19).  |  |
| <b>4.0.0</b> | <b>General Models</b>   |  |
| 4.0.1        | The Management Committee <b>endorsed</b> 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). |  |

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**ANNEX 2: SUMMARY OF CURRENT ACTIVE REQUESTS BY NAMMCO COUNCIL TO THE SCIENTIFIC COMMITTEE,  
AND RESPONSES BY THE SCIENTIFIC COMMITTEE**

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. See List of References for sources of meeting documents. 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  |
|--------------|--|--|--|---------|
| <b>1.1.0</b> | <b>MARINE MAMMAL – FISHERIES INTERACTIONS:</b> |  |  |         |
| 1.1.1        | NAMMCO/1<br>1992                               | To provide an overview of the current state of knowledge of the dependence of marine mammals on the fish and shrimp stocks and the interrelations between these compartments.  |  | Ongoing |
| 1.1.2        | NAMMCO/1<br>1992                               | In the multispecies context ... to address specific questions related to the Davis Strait ecosystem such as: <ul style="list-style-type: none"> <li>- the apparent increase in harp seal stocks;</li> <li>- its influence on the economically important shrimp and cod stocks;</li> <li>- the impact of the fisheries on marine mammals, particularly harp seals;</li> <li>- the southward shift of minke whale distribution in recent years, and</li> <li>- observed changes in oceanographical conditions after the 1970s;</li> <li>- and to the East Greenland-Iceland-Jan Mayen area interactions between capelin stocks, fishery and marine mammals.</li> </ul> | Questions related to harp and hooded seals were forwarded to the ICES/NAFO Joint Working Group on Harp and Hooded Seals (SC/2). Specific questions related to the Davis Strait ecosystem were not addressed. | Ongoing |
| 1.1.3        | NAMMCO/2<br>1993                               | To assess the impact of marine mammals on the marine ecosystem, with special emphasis on the availability of economically important fish species.  |  | Ongoing |
| 1.1.5        | NAMMCO/7<br>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.  |  | Ongoing |

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| 1.1.6 | NAMMCO/16<br>02-2007 | <p>The Commission requested the Scientific Committee to review the results of the Icelandic programme on the feeding ecology of minke whales and multi-species modelling as soon as these become available.</p> <p>The MC concluded that the SC does not need to do any further review of the Icelandic minke whale program in addition to the work already completed by the IWC Expert Panel. (NAMMCO/22)</p> | <p>The SC considered that new development in ecosystem modelling warranted a new meeting of the WG on Marine Mammal Fishery Interactions. The WG would then be in charge of reviewing the results from the Icelandic Programme and advances in Ecosystem Modelling. The SC <b>recommended</b> that the WG expands its terms of reference to include all areas under NAMMCO jurisdiction and investigate dynamic changes in spatial distribution due to ecosystem changes and functional responses. (SC/15).</p> <p>The SC forwarded this task to the WG on Marine Mammal Fisheries Interaction (MMFI) convened in 2009 Only preliminary results were presented and it was still too early to undertake a general review of the results. (SC/16).</p> <p>Víkingsson presented a short overview of the results from the Icelandic common minke whale research program conducted according to the Special Permit rules of the IWC. These results had been presented and reviewed at an Expert Panel workshop held in Reykjavík. The SC notes ... that the quality of the research will be further determined through the peer-review publication process. The SC also acknowledged that the IWC review is set according to guidelines set by the IWC for the reviewers — for example, reviewers focused on whether this research can be done using non-lethal means, and how these data can be used in assessments. These are not necessarily same criteria that NAMMCO might use.</p> <p>The SC draws the attention of the MC to the results from the IWC Expert Panel review process and the abovementioned papers and reports detailing the results from the program. The SC awaits guidance</p> | Ongoing |
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|              |   |   | from the council concerning potential further review of the results within NAMMCO. (SC/20)   |         |
| 1.1.7        | NAMMCO/16<br>02-2007                          | The Committee requested the Scientific Committee to take into consideration the drafted text (NAMMCO/16/6) provided by the former By-catch WG in formulating how to handle by-catch issues in the future.   | The SC <b>recommended</b> the organization of a workshop to review the use and applicability of the by-catch monitoring systems in use in different organizations and suggested to seek contact with other organizations dealing with by-catch monitoring in view of initiating collaboration on this matter. (SC/15).<br><br>Steps were taken towards the organisation of the workshop. (SC/16).  | Ongoing |
| 1.1.8        | NAMMCO/17<br>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 judged 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).   | Ongoing |
| <b>1.2.0</b> | <b>MULTISPECIES APPROACHES TO MANAGEMENT:</b> |   |  |         |
| 1.2.1        | NAMMCO/1<br>1992                              | To consider whether multispecies models for management purposes can be established for the North Atlantic ecosystems and whether such models 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. | Vikingsson updated the SC on the Ecosystem Modelling project for which funding was being sought. The initial NAMMCO research program has developed into a much broader project with modelling at the core, including more general fisheries management considerations and a socioeconomic component.<br><br>The project has now been funded for 6 million Euros for the next 4 years. The funded project has been adapted for the call for research proposals from the EU, and now includes 29 institutes from 16 countries. It still contains parts of the original marine mammal components. Iceland is still a core area, and the project has been expanded to include many other | Ongoing |

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|              |  |   | <p>areas, however multispecies modelling in the Barents Sea has been removed.</p> <p>The SC <b>noted</b> that the original NAMMCO project (coordinated by Lars Walløe) has been changed but the Icelandic component is still included. (SC/20)</p>  |         |
| 1.2.2        | NAMMCO/5<br>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. | <p>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).</p> | Ongoing |
| <b>1.3.0</b> | <b>SEALWORM INFESTATION:</b>                                     |   |   |         |
| <b>1.4.0</b> | <b>ECONOMIC ASPECTS OF MARINE MAMMAL-FISHERIES INTERACTIONS:</b> |   |   |         |
| 1.4.1        | NAMMCO/7<br>05-1997  | The Council requested that special attention be paid to studies related to competition and the economic aspects of marine mammal-fisheries interactions.  | <p>The Scientific Committee established a Working Group on Economic Aspects of Marine Mammal-Fisheries Interactions. The Scientific Committee concluded that inclusion of economic considerations is a valuable addition to multispecies models of interactions between marine mammals and fisheries. The work presented at the Working Group was considered the first step towards more complete analyses of these interactions and it was recommended, in light of the economic impacts, that</p>   | Ongoing |

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|       |                      |  | more complete models should be developed and presented. The Scientific Committee showed a continued interest in the development of the models and it was decided to maintain the Working Group and seek further guidance from the Council on matters of particular interest. (SC/6).  |         |
| 1.4.2 | NAMMCO/8<br>09-1998  | <p>The Scientific Committee is requested to investigate the following economic aspects of marine mammal – fisheries interactions:</p> <ul style="list-style-type: none"> <li>– to identify the most important sources of uncertainty and gaps in knowledge with respect to the economic evaluation of harvesting marine mammals in the different areas;</li> <li>– to advise on research required to fill such gaps both in terms of refinement of ecological and economical models and collection of basic biological and economical data required as input parameters for the models;</li> <li>– to discuss specific cases where the state of knowledge may allow quantification of the economic aspects of marine mammal – fisheries interactions: <ul style="list-style-type: none"> <li>a) what could be the economic consequences of a total stop in harp seal exploitation versus different levels of continued sustainable harvest?</li> <li>b) what could be the economic consequences of different levels of sustainable harvest vs. no exploitation of minke whales?</li> </ul> </li> </ul> | <p>The Working Group On The Economic Aspects Of Marine Mammal - Fisheries Interactions was reactivated to meet this request. It was agreed to separate the request into two sections. At the first Working Group meeting the first two items in the request were addressed. The Working Group used available information to derive estimates of consumption of cod, herring, capelin and shrimp by harp seals, minke whales and <i>Lagenorhynchus</i> spp. and bottlenose dolphins in some areas. Multispecies models presently in use or under development in Norway and Iceland offer a means of assessing the impact of marine mammal predation on fish stocks.</p> <p>The Scientific Committee therefore <b>recommended</b> that the next logical step in addressing the request should be for NAMMCO to lead or assist in the development of a multispecies-economic model for a candidate area. However, the Scientific Committee reiterated that the estimation and model uncertainties are such that definitive quantification of the economic aspects of marine mammal-fisheries interactions in candidate areas cannot be expected in the near term. (SC/8).</p> <p>See under 1.1.6. (SC/15).</p> | Ongoing |
| 1.4.3 | NAMMCO/10<br>09-2000 | <p>Noting the requests for advice from the Council at its Eighth meeting in Oslo 1998 (see Annual Report 1998 page 23), the Management Committee <b>recommended</b> that the Scientific Committee continue the assessment of the economic aspects of</p>   | <p>The Scientific Committee convened a workshop, under the theme "Marine mammals: From feeding behaviour or stomach contents to annual consumption – what are the main uncertainties?", to further investigate the methodological and analytical</p>  | Ongoing |

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|       |                      | fishery - marine mammal interactions in the two areas (Barents Sea and Iceland) and with the two species (minke whales and harp seals) that have been identified as feasible for this assessment.  | problems in estimating consumption by marine mammals. (SC/9).   |         |
| 1.4.5 | NAMMCO/11<br>02-2002 | The Management Committee noted the conclusion of the Scientific Committee that the estimation and model uncertainties are such that the economic aspects of marine mammal-fishery interactions in candidate areas cannot be quantified without further work. The Management Committee therefore <b>recommended</b> that the Scientific Committee should hold a workshop on ecosystem models aiming for a better understanding of the ecological role of minke whales and harp and hooded seals in the North Atlantic, as proposed in the Scientific Committee report.                | The Scientific Committee convened a workshop, under the theme "Modelling Marine Mammal – Fisheries Interactions in the North Atlantic", to investigate how presently available ecosystem models can be adapted for quantifying marine mammal - fishery interactions. (SC/10).<br><br>See under 1.1.6. (SC/15).  | Ongoing |
| 1.4.6 | NAMMCO/12<br>03-2003 | The Management Committee agreed that the Scientific Committee should monitor progress made in multispecies modelling and in the collection of input data and decide when enough progress has been made to warrant further efforts in this area. Future meetings should focus on assessing modelling results from the Scenario Barents Sea model and possibly the GADGET-based template models for other areas, if they are developed. The Scientific Committee should also consider the feasibility of connecting the multi-species models with simple economic models at that time. | The SC convened in 2009 the WG on Marine Mammal Fisheries Interaction (MMFI) because it judged at its last meeting that the developments in modelling and other progress which had occurred in Norway, Canada and Japan warranted their review.<br><br>The degree of progress in the quantitative description of marine mammal diets is in general not extensive and a considerable amount of work still remains. Some new approaches to estimating diet appear promising but still required verification.<br><br>Multi-species modelling is a valid approach for a better understanding of the ecological relations between species. However, the multi-species modelling required in order to address management questions is quite complex and the current multi-species models are not, at this time, sufficient to provide quantitative management advice, which is presently provided by single species management. | Ongoing |

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|              |   |  | <p>Additional research is required in order to develop ecosystem models to a point where it may become possible, although with no guarantee, to use them to provide quantitative management advice.</p> <p>Therefore the SC <b>recommends</b>, as the best way forward, carrying out the modelling exercise suggested by the WG on MMFI for comparing the results of different models on the same ecosystem(s) using a common dataset. (SC/16).</p> <p>See 1.2.1.</p>            |         |
| <b>1.5.0</b> | <b>ENVIRONMENTAL ISSUES:</b>  |  |  |         |
| 1.5.1        | NAMMCO/1 1992   | To describe the possible pathways of radioactive material from blowouts and leakage in existing nuclear power plants, leakage from dumped material and possible accidents in planned recycling plants in the northern part of Scotland into the food web of the North Atlantic and hence into the top predators like marine mammals. | Forwarded to ICES.   | Pending |
| <b>1.6.0</b> | <b>MANAGEMENT PROCEDURES:</b>   |  |  |         |
| <b>1.7.0</b> | <b>MONITORING MARINE MAMMAL STOCK LEVELS AND TRENDS IN STOCKS /NORTH ATLANTIC SIGHTINGS SURVEYS (NASS):</b> |  |  |         |
| 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). | Ongoing |



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|               |                              |  | Estimates of abundance for some key species are available and referred to in the SC report (SC/17).  |                    |
| <b>1.7.12</b> | NAMMCO/22-2014               | <b>Greenland requests the SC to give information on sustainable yield based on new abundance estimates expected from T-NASS 2015 for all large baleen whales in West Greenland waters.</b>   |  | <b>New Request</b> |
| <b>1.8.0</b>  | <b>OTHER:</b>                |  |  |                    |
| 1.8.1         | NAMMCO/8 09-1998             | Greenland noted the need for greater input from hunters and users in the work of the Scientific Committee. While noting the need for scientists to be able to conduct their work on their own scientific terms in the context of their Committee meetings, it was suggested that scientists and users of marine mammal resources which are the subject of examination by the Scientific Committee could, for example, meet prior to meetings of the Scientific Committee in order to exchange information relevant to the work planned by the Scientific Committee. With these ideas in mind, Greenland recommended that concrete steps should be taken to provide for a more active dialogue between scientists and resource users. This recommendation was <b>endorsed</b> by Council. | <p>The Scientific Committee agreed to a proposal put forward by the Secretariat, to use the “Status of Marine Mammals in the North Atlantic” stock status reports as a means of incorporating the knowledge of marine mammal users. This proposal was presented to NAMMCO Council for approval. (SC/7).</p> <p>The Scientific Committee Working Group on the Population Status of Narwhal and Beluga in the North Atlantic met jointly with the Scientific Working Group of the Joint Commission on the Conservation and Management of Narwhal and Beluga (JCNB) in May 2001. Prior to the main meeting, the Joint Working Group met with hunters from Greenland and Canada, and Canadian hunters participated throughout the meeting. (SC/9).</p> | Ongoing            |
| 1.8.2         | NAMMCO/9 10-1999             | With respect to the language used in the Report of the Scientific Committee, Greenland suggested that it must be kept precise and simple. The Management Committee agreed to convey this as a suggestion to the Scientific Committee.  | No response.   | Ongoing            |
| <b>2.1.0</b>  | <b>HARP AND HOODED SEALS</b> |  |  |                    |
| 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  | An update of the stock status of North Atlantic hooded seals had been made by the WGHARP at its 2008 meeting, which in turn had been endorsed by the Committee. The SC notes that this is a standing request   | Standing           |

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|  |  | <p>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 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.</p> | <p>that will be taken up again when new data become available.</p> <p>Considering that the population in the Greenland Sea in 2007 is still well below <math>N_{lim}</math>, and the results of the 2007 survey were similar to those in 2005, the SC reiterates its recommendation from SC 14 that the catches in the Greenland Sea be restricted to necessary scientific catches and to satisfy local needs at roughly current levels. (SC/16).</p> <p>Updates on harp &amp; hooded seals from WGHARP were presented at SC/20.</p> <p>Harp Seals<br/><i>White Sea / Barents Sea</i><br/>WGHARP expressed concerns on the high removals and declining population resulting from the PBR estimations, and concluded that the estimated equilibrium catches were the most preferred option. The current equilibrium option is slightly higher than the previous option, given in 2011. This is possibly a result of no, or very low catches in 2012 and 2013.</p> <p><i>Greenland Sea</i><br/>New aerial surveys to assess harp seal pup production were conducted in the Greenland Sea in 2012 and resulted in an estimate of 89,590 (SE 12,310) pups. This estimate is slightly, but not significantly lower than those from similar surveys in 2002 and 2007.</p> <p>Since Greenland Sea harp seals are classified as data rich, ICES now found the Precautionary Approach framework developed for the management of harp and hooded seals appropriate for the population...Using this approach, a modelled catch level of 21,270 1+ animals, in 2014 and subsequent years, is obtained.</p> |  |
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|  |  |  | <p>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.</p> <p><i>Northwest Atlantic</i><br/>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.</p> <p><b>Hooded Seals</b><br/><i>Greenland Sea</i><br/>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.</p> <p>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 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 <math>F=0.7</math>, the model runs indicate a current population size of approximately 83,000 which</p> |  |
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|       |                      |   | 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).  |         |
| 2.1.6 | NAMMCO/14<br>03-2005 | <p>The Management Committee <b>recommended</b> that the Scientific Committee evaluate how a projected decrease in the total population of Northwest Atlantic harp seals might affect the proportion of animals summering in Greenland.</p> <p>Greenland agreed to send a new request to ICES in order to finalise 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 (NAMMCO/22).</p> | <p>With regard to this request, the SC notes that it had recommended several times (SC 13, 14, 15) that this question be referred to the ICES-NAFO Working Group. However, since this has not been done by Greenland, the SC tasked the MMFI WG to deal with the request. The conclusion of the WG is reported in document SC/16/08.</p> <p>The SC concludes that there were clear positive correlations between catches of harp seals off northwest and southwest Greenland and abundance estimates of these seals off Canada. Hence a decrease in the numbers of seals in Canada is likely to cause a decrease of the catches in Greenland. This relationship might not be linear, but is difficult to quantify. As suggested by the WG, one way to proceed would be to attempt multi-linear regression analysis, which takes account of any information available on annual hunting effort and periods for which the seals stay off Greenland, as well as the Canadian abundance estimates. This would also allow the calculation of confidence limits associated with any estimate of a decrease in catch. (SC/16).</p> <p>New requests to ICES from individual countries would be needed for a new meeting to finish assessments of Barents Sea and Northwest Atlantic harp seals. Preferably such requests should come from Russia and Greenland, respectively (SC/20).</p> | Ongoing |

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| 2.1.9 | NAMMCO/16<br>02-2007 | <p>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.</p> <p>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</p> | <p>This request was forwarded to the ICES-NAFO WG, which dealt with this request at its meeting in Tromsø in 2008. (SC/15).</p> <p>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.</p> <p>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 the Greenland Sea. It <b>strongly recommends</b> that these activities are given high priority in the coming years. (SC/16).</p> <p>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</p> | Ongoing |
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Report of the Management Committees – Annex 2

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|        |                       | importance in getting answers to request R 2.1.9 (NAMMCO/22).  | would be desirable, and that a formal request to ICES for such cooperation could be sent (SC/20).  |          |
| 2.1.10 | NAMMCO/17<br>09-2008  | <p>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.</p> <p>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).</p> | <p>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.</p> <p>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).</p> | Standing |
| 2.1.11 | NAMMCO/ 18<br>09-2009 | The Scientific Committee is requested to evaluate how a projected increase in the total population of Northwest Atlantic harp seals might affect the proportion of animals summering in Greenland.   | As the NAMMCO SC has no tradition of establishing WGs on harp seals, the SC recommended that Greenland forward the request to ICES/NAFO so that it can be considered by the WGHARP.  | Pending  |

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|              |                      |  | <p>The request has been forwarded to ICES by Greenland and is on the agenda of the ICES NAFO WG on harps and hoods meeting in August 2011.</p> <p>(WGHARP 2011) New estimates of abundance need to be developed to discriminate between actual and perceived changes in abundance. The population is believed to approach carrying capacity and this is normally associated with new factors becoming important for a continued growth of the population. It is therefore uncertain whether the distribution of the seals in the years to come is predictable based on hind-cast analysis. Such analyses will, however, be important to describe how distribution patterns change as the population and the environment change. Historically the abundance of seals in Greenland waters was positively associated with increases in the harp seal population. Since 2000, it appears that ecological and hydrographical changes have changed the relationship, and possibly led to decreases in harp seals. However, there are insufficient data available to adequately analyse the latter (SC/19).</p> |          |
| <b>2.3.0</b> | <b>RINGED SEALS:</b> |  |  |          |
| 2.3.1        | NAMMCO/5<br>02-1995  | <p>To advise on stock identity of ringed seals (<i>Phoca hispida</i>) 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.</p> <p>The Management Committee endorsed again this request as a standing request. (NAMMCO 19)</p> <p>The Management Committee took note of the report from the Scientific Committee and endorsed the idea of</p> | <p>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).</p> <p>Papers considered by the Working Group as well as other papers were published in the first volume of NAMMCO Scientific Publications, <i>Ringed Seals in the North Atlantic</i>.</p> <p>The SC noted that there is currently very little information on stock structure and stock size to</p>   | Standing |

Report of the Management Committees – Annex 2

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|              |                      | a Working Group in 2015 or later when enough information is available (NAMMCO 22).   | <p>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.</p> <p>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).</p> |          |
| 2.3.2        | NAMMCO/7<br>05-1997  | <p>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.</p> <p>The Management Committee endorsed again this request as a standing request. (NAMMCO 19)</p> <p>See 2.3.1 for update from NAMMCO 22.</p>                                       | <p>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 Scientific Committee then identified the main gaps in knowledge, and <b>recommended</b> research required to address them. (SC/6).</p> <p>See 2.3.1 for update from SC/20.</p>   | Standing |
| <b>2.4.0</b> | <b>GREY SEALS:</b>   |  |   |          |
| 2.4.2        | NAMMCO/11<br>02-2002 | <p>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</p> | <p>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).</p> <p>The SC recommends:</p>   | Standing |



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|  | <p>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 <b>recommended</b> that the Scientific Committee provide a new assessment of grey seal stocks throughout the North Atlantic.</p> | <ul style="list-style-type: none"> <li>• Establishment and/or continuation of standardised and regular monitoring programmes for seal abundance in all countries, including the development of appropriate survey methods.</li> <li>• Securing catch records and associated data from hunted seals.</li> <li>• Quantification and standardisation of methods to estimate struck and lost and by-catch.</li> <li>• Population assessment of both species in <i>Russia</i>.</li> <li>• Survey of harbour seals along the coast of <i>Iceland</i>.</li> <li>• Studies to identify the population structure of <i>Norwegian</i> harbour seals.</li> <li>• Exploration of the south-eastern <i>Greenland</i> coast for the presence of harbour and grey seals.</li> <li>• Estimation of the stock identity, size, distribution and structure of the <i>Faroese</i> population of grey seals.</li> <li>• Completion of the ongoing genetic analyses of grey seal population structures for the north Atlantic including new samples from the <i>Faroe Islands</i>.</li> </ul> <p>The SC furthermore recommends</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Compilation of a database of samples stored in the NAMMCO countries. (SC/18)</li> </ul> |  |
|  | <p>The Management Committee took note of the report from the Scientific Committee and endorsed that the Working Group on Grey and Harbour Seals meet in</p>   |   |  |

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|              |                      | 2014/2015 in order to finalise requests 2.4.2 and 2.5.2. (NAMMCO 22).  | The SC recommended that the Grey and Harbour Seals WG meet in 2014, reflecting the recommendations to finalise the <b>request 2.4.2.</b> (SC/19 and reiterated at SC/20)  |         |
| <b>2.5.0</b> | <b>HARBOUR SEAL</b>  |  |   |         |
| 2.5.2        | NAMMCO/16<br>02-2007 | <p>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.</p> <p>The Management Committee agreed to change the geographical focus of this request to entail ALL areas. (NAMMCO 19)</p> | <p>At its meeting 2007 (SC/15), the SC <b>recommended</b> that an assessment be conducted in 2010 after the third Norwegian survey, leaving Iceland time for developing a management plan. 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 <b>recommends</b> that an assessment be conducted early 2011. Data on removals are still needed both for Iceland and Norway. (SC/16).</p> <p>The SC reiterated the recommendation that a formal assessment of harbour seals in all areas be carried out by a WG meeting on coastal seals in 2011. SC <b>recommended</b> that a WG on coastal seals be held to review the <i>Norwegian</i> 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 <i>Iceland</i> would improve the assessment. If a meeting is planned for early 2011, another meeting is likely required to fulfill the task. (SC/17)</p> <p>The SC recommends:</p> <ul style="list-style-type: none"> <li>• Establishment and/or continuation of standardised and regular monitoring programmes for seal abundance in all countries, including the development of appropriate survey methods.</li> </ul> | Pending |

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|              |                         | See 2.4.2 for update from NAMMCO 22. | <ul style="list-style-type: none"> <li>• Securing catch records and associated data from hunted seals.</li> <li>• Quantification and standardisation of methods to estimate struck and lost and by-catch.</li> <li>• Population assessment of both species in <i>Russia</i>.</li> <li>• Survey of harbour seals along the coast of <i>Iceland</i>.</li> <li>• Studies to identify the population structure of <i>Norwegian</i> harbour seals.</li> <li>• Exploration of the south-eastern <i>Greenland</i> coast for the presence of harbour and grey seals.</li> <li>• Estimation of the stock identity, size, distribution and structure of the <i>Faroese</i> population of grey seals.</li> <li>• Completion of the ongoing genetic analyses of grey seal population structures for the north Atlantic including new samples from the <i>Faroe Islands</i>.</li> </ul> <p>The SC furthermore recommends</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Compilation of a database of samples stored in the NAMMCO countries. (SC/18)</li> </ul> <p>The SC recommended that the Grey and Harbour Seals WG meet in 2014, reflecting the recommendations to finalise the <b>request 2.5.2</b>. (SC/19 and reiterated at SC/20)</p> |  |
| <b>2.6.0</b> | <b>ATLANTIC WALRUS:</b> |                                      |  |  |

Report of the Management Committees – Annex 2

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| 2.6.3        | NAMMCO/15<br>03-2006 | <p>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.</p> <p>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).</p> | <p>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).</p> <p>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)</p> <p>With regard to R- 2.6.3, the SC noted that there is no new information available to consider this request (SC/20).</p> | Ongoing   |
| 2.6.6        | NAMMCO/21<br>09-2012 | <p>The Management Committee requested the SC to investigate the possibility to include a carryover for quotas in order to include this possibility in the next hearing for the new quota block period (NAMMCO 21).</p> <p>The Management Committee also noted that the Scientific Committee had given their advice on request R 2.6.6 and that this request was now finalised (NAMMCO 22).</p>                                 | <p>The SC concluded that there is no biological argument against carryover of unused quotas. A problem arises if carryovers accumulate over time and/or across assessments (SC/20).</p>  | Completed |
| <b>3.1.0</b> | <b>FIN WHALE:</b>    |  |  |           |
| 3.1.7        | NAMMCO 17<br>09-2008 | <p>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.</p>  | <p>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).</p> <p>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</p>   | Ongoing   |

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|              |                        | <p>MC endorsed this recommendation for a Large Whale Assessment Working Group to convene in Fall 2014 (NAMMCO 22).</p>  | <p>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.</p> <p>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).</p>   |         |
| <b>3.2.0</b> | <b>HUMPBACK WHALE:</b> |   |   |         |
| 3.2.4        | NAMMCO/15 03-2006      | <p>The Commission requested the Scientific Committee to conduct a formal assessment following the completion of the T-NASS.</p> <p>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.</p> <p>The MC recommends that the Large Whale Assessment working group should not consider humpback whales at the upcoming meeting in Fall 2014 (NAMMCO 22).</p> | <p>The SC <b>recommended</b> 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).</p> <p>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 assessment in other areas and agreed to seek further guidance from the Council regarding that aspect of the request.</p> <p>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).</p> | Pending |
| <b>3.3.0</b> | <b>MINKE WHALE:</b>    |   |   |         |

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| 3.3.4        | NAMMCO/17<br>09-2008       | <p>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.</p> <p>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)</p> | <p>The Assessment WG was convened to help answer with temporary advice. The SC <b>recommends</b> 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.</p> <p>A full assessment, including the 2009 estimate, will be conducted at the next meeting of the Assessment WG in January 2010. (SC/16).</p> <p>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.<br/>(SC/17)</p> | Ongoing |
| <b>3.4.0</b> | <b>NARWHAL AND BELUGA:</b> |   |  |         |
| 3.4.9        | NAMMCO/14<br>03-2005       | <p>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.</p>  | <p>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).</p> <p>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).</p> <p>The SC is not in the position to progress on this issue at this point and <b>recommends</b> 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</p>  | Ongoing |

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|        |                      | <p>The MC supports the continued planning of the disturbance workshop for beluga and narwhal, and also recommends including walrus (NAMMCO 22).</p>   | <p>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 <b>recommends</b> 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).</p> <p>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.</p> <p>Relating to <b>Request 3.4.9</b>: In 2011, the SC proposed a symposium on beluga and narwhals in relation to disturbance and industrial activities. The SC <b>recommends</b> this symposium to be held in 2015 and awaits further guidance from Council before proceeding with the planning (SC/20).</p> |         |
| 3.4.10 | NAMMCO/14<br>03-2005 | <p>Surveys for estimating abundance and trends are an essential component of the assessment of the conservation status of all marine mammals. The Management Committee recognizes that the planning, conduct and interpretation of surveys is a very contentious issue between hunters, managers and scientists in Greenland. Such surveys must be planned using the best available expertise, including input from hunters, so that all will have confidence in their results. The Committee therefore <b>recommends</b> that future</p> | <p>The SC noted that that the survey carried out in 2006 had been planned with consideration of the recommendations of the Committee and with extensive consultations with local hunters. The SC recommended that the plans for the survey of Inglefield Bredning/Melville Bay scheduled for August 2007 be reviewed by the T-NASS Planning Committee at their next meeting (SC/14).</p>   | Ongoing |

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|        |                      | <p>surveys for beluga and narwhal should be planned using the international expertise available through the Scientific Committee of NAMMCO, and with input from hunters at the planning stage. In addition, if and when new survey methods are applied, they should be calibrated against previously used methods so that the validity of the survey series for determining trends in abundance is insured.</p> | <p>The plans for the 2007 narwhal and beluga surveys were not presented to the T-NASS committee and therefore not reviewed by this committee. (SC/15).</p> <p>Advice from hunters was sought for organising the 2006 and 2007 aerial survey off West Greenland. However the SC regrets that the survey plans had never been submitted to the Abundance Estimates WG as indicated. (SC/16).</p> <p>An aerial survey of narwhals was conducted in the North Water in May 2009 and 2010 with the purpose of developing a fully corrected abundance estimate. The resulting abundance estimates were 10,677 narwhal (6,120-18,620) in 2009 and 4,775 narwhals (2,417-9,430) in 2010. The JWG and the SC (SC/19) approved that these abundance estimates can be used for assessment purposes of the Inglefield Bredning stock. (SC/19)</p> <p>Aerial surveys of belugas were conducted in the North Water in May 2009 and 2010 with the purpose of developing fully corrected abundance estimates. The resulting abundance estimates were 2,008 beluga (95% CI 1,050-3,850) in 2009 and 2,482 beluga (95% CI 1,439-4,282) in 2010. (SC/19)</p> |          |
| 3.4.11 | NAMMCO/17<br>09-2008 | <p>The Scientific Committee is requested to update the assessment of both narwhal and beluga, noting that new data warrant such an exercise.</p>  | <p>The SC endorses the assessment performed by the JWG.</p> <p>Narwhal: noted that the conclusion reached differed from those reached in 2005. It <b>recommends</b> 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.</p>  | Standing |



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|  |  |  | <p>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.</p> <p>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 <b>strongly recommends</b> 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 leave the population an 70% to 95% probability of a continued increase until 2014. (SC/16).</p> <p>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</p> |  |
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|                     |                      |   | <p>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.</p> <p>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.</p> <p>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)</p> |      |                |                     |    |              |    |           |    |           |    |       |     |         |
|---------------------|----------------------|---|--|------|----------------|---------------------|----|--------------|----|-----------|----|-----------|----|-------|-----|---------|
| 3.4.12              | NAMMCO/19<br>09 2010 | The Scientific Committee is requested to provide advice on sustainable takes of narwhal from the Kane Basin in spring, summer and fall. | <p>The request is part of the ToR for the NAMMCO/JCNB JWG meeting scheduled for 12 – 18 February 2012. (SC/18)</p> <p>The JWG and the SC agreed that the models explored at the current meeting, incorporating recent abundance estimates, updated age distribution data and new movement information from satellite tracking, confirmed that the current quotas in Greenland, for each stock area (Table 1), are sustainable:</p> <table><tr><th>Area</th><th>Current quotas</th></tr><tr><td>Inglefield Bredning</td><td>85</td></tr><tr><td>Melville Bay</td><td>81</td></tr><tr><td>Uummannaq</td><td>85</td></tr><tr><td>Disko Bay</td><td>59</td></tr><tr><td>Total</td><td>310</td></tr></table>  | Area | Current quotas | Inglefield Bredning | 85 | Melville Bay | 81 | Uummannaq | 85 | Disko Bay | 59 | Total | 310 | Ongoing |
| Area                | Current quotas       |   |  |      |                |                     |    |              |    |           |    |           |    |       |     |         |
| Inglefield Bredning | 85                   |   |  |      |                |                     |    |              |    |           |    |           |    |       |     |         |
| Melville Bay        | 81                   |   |  |      |                |                     |    |              |    |           |    |           |    |       |     |         |
| Uummannaq           | 85                   |   |  |      |                |                     |    |              |    |           |    |           |    |       |     |         |
| Disko Bay           | 59                   |   |  |      |                |                     |    |              |    |           |    |           |    |       |     |         |
| Total               | 310                  |   |  |      |                |                     |    |              |    |           |    |           |    |       |     |         |

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|                      |                      |   | A new and updated advice is expected from the next JWG meeting, based on the allocation method to be developed at the proposed intercessional meeting (SC/19).  |         |
| 3.4.13               | NAMMCO/19<br>09 2010 | <p>In view of recent dynamic changes in the environment the Scientific Committee is requested to reconsider the temporal and geographical restrictions on the takes of beluga from West Greenland within the framework of the NAMMCO/JCNB JWG.</p> <p>Concerning R-3.4.13. Greenland reported that it was discussed thoroughly at last year's meeting but cannot see that it was reflected in last year's report. The MC views this request as completed (NAMMCO 22).</p> | <p>The request is part of the ToR for the NAMMCO/JCNB JWG meeting scheduled for 12 – 18 February 2012. (SC/18)</p> <p>Beluga: The JWG and the SC (SC/19) reiterated the recommendations for seasonal closures:</p> <ul style="list-style-type: none"> <li>Northern area (Ummannaq, Upernavik and Qaanaaq): June through August</li> <li>Central area (Disko Bay): June through October</li> <li>Southern area (south of Disko Bay to 65°N): May through October.</li> <li>The area south of 65°N, closed for hunting.</li> </ul> <p>The purpose of these closures is to allow for the possibility of reestablishment of local aggregations of belugas in Greenland.</p> <p>There is no new information on R-3.4.13 (SC/20).</p> | Ongoing |
| <b>3.5.0</b>         | <b>SEI WHALES:</b>   |   |   |         |
| <b>3.5.3 amended</b> | NAMMCO/19<br>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  | 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).  | <p>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)</p> <p>There is no new information available with regards to this request.</p> <p>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).</p> |         |
| <b>3.6.0</b> | <b>NORTHERN BOTTLENOSE WHALES:</b> |  |   |         |
| <b>3.7.0</b> | <b>KILLER WHALES:</b>              |  |   |         |
| 3.7.2        | NAMMCO/13<br>03-2004               | <p>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.</p> <p>MC <b>notes</b> the SC report that there is no new information available for R-3.7.2 (NAMMCO 22).</p> | <p>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.</p> <p>Not enough information still. (SC/15).</p> <p>Situation unchanged (SC/16).</p> <p>The SC again noted that there is not sufficient new information to answer this request at this time (SC/20).</p>   | Ongoing |

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| <b>3.8.0</b> | <b>LONG-FINNED PILOT WHALES:</b> |  |   |          |
| 3.8.3        | NAMMCO/16<br>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.          | <p>The SC convened a WG for developing such a proposal, under the chairmanship of C. Lockyer. The monitoring programme is under development. (SC/15).</p> <p>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).</p>  | Standing |
| 3.8.4        | NAMMCO/16<br>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. | <p>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).</p> <p>See item 1.7.11 (SC/16).</p> <p>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</p> | Ongoing  |

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|       |                      | <p>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 stocks that contribute to the hunt in the Faroes. Ongoing work will continue into abundance estimates and stock identity.</p> <p>The MC noted that a new abundance estimate is anticipated after TNASS2015 (NAMMCO 22).</p> | <p>causes of the apparent decline in the relative abundance of pilot whales in the index areas. The 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).</p>   |         |
| 3.8.5 | NAMMCO/19<br>09 2010 | <p>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.</p>  | <p>The <b>SC recommends</b> 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)</p> <p>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</p> | Ongoing |

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|       |  |   | 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 <i>et al.</i> 2000), although the extent of this is not known. (SC/19)  |         |
| 3.8.6 | NAMMCO 2009 2011   | The Scientific Committee is <b>requested</b> 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. | <p>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.</p> <p>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.</p> | Ongoing |
| 3.9.0 | <b>DOLPHIN SPECIES (<i>Tursiops</i> and <i>Lagenorhynchus</i> spp.):</b> |   |   |         |

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| 3.9.6         | NAMMCO/13<br>03-2004      | <p>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 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.</p> | <p>There is still insufficient data on these species to conduct an assessment, but the SC <b>recommended</b> 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).</p> <p>The Committee notes that there are still not enough data (life history and abundance) for any of the three species to complete an assessment. The Faroes have samples for diet and life history parameters from 350 white-sided dolphins, but the analysis is not completed yet. (SC/16).</p> <p>The SC <b>noted</b> that the data on life history and abundance for any of the three species is still not sufficient for an assessment and <b>recommended</b> 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)</p> <p>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).</p> | Pending. |
| <b>3.10.0</b> | <b>HARBOUR PORPOISES:</b> |  |  |          |
| 3.10.1        | NAMMCO/7<br>05-1997       | <p>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</p>   | <p>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</p>  | Ongoing  |



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|  |  | <p>include distribution and abundance, stock identity, biological parameters, ecological interaction, pollutants, removals and sustainability of removals.</p> | <p>interactions; pollutants; removals and sustainability of removals. (SC/6).</p> <p>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 address some of the information needs for management of this species. (SC/8).</p> <p>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).</p> <p>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).</p> <p>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).</p> <p>The SC recommended that an assessment meeting for harbour porpoises in all areas be held during the winter</p> |  |
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|  |  | <p>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).</p> | <p>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)</p> <p>Update: A total annual by-catch estimate of 6,900 harbour porpoises in Norway was reported. This estimate is substantial, and it raises concerns that the by-catch of harbour porpoises in Norway may not be sustainable. Therefore the SC recommended initiating an assessment of harbour porpoises in Norway. This process should include <i>i)</i> reviewing the by-catch estimates <i>ii)</i> examining the relevant abundance estimates <i>iii)</i> assessing the need for coastal surveys of harbour porpoises in Norway <i>iv)</i> investigating the use of satellite tracking for stock delineation, and <i>v)</i> evaluating the use of acoustic deterrents (pingers) in the gillnet fishery in order to reduce the by-catch.</p> <p>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)</p> <p>The NAMMCO Working Group on Harbour Porpoises met in Copenhagen 4-6 November 2013. This was the first meeting and terms of reference was to provide a full assessment for West Greenland, and to initiate the</p> |  |
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|  |  | <p>The MC <b>endorses</b> the recommendations of the SC (NAMMCO 22).</p> | <p>process for Norway, including a review of the method used for obtaining total by-catch estimates.</p> <p><i>Greenland</i><br/> 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.</p> <p>Taking into consideration the work of the HP WG, the SC recommends the following:</p> <p><i>Greenland</i><br/> 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.</p> <p>2. The SC noted that T-NASS 2015 may provide a new abundance estimate for West Greenland and</p> |  |
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|  |  |  | <p>recommended that a new assessment not be considered until the outcome of this survey is known</p> <p><i>Norway</i></p> <p>1. That Norway expand the information about by-catch giving the next priority to the lumpfish fishery by-catch.</p> <p>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)</p> <p>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.</p> <p>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.</p> |  |
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### SECTION 3 - SCIENTIFIC COMMITTEE

|            |  |            |
|------------|--|------------|
| <b>3.1</b> | <b>Report of the Twentieth Meeting of the Scientific Committee.....</b>                  | <b>153</b> |
|            | Executive summary.....   | 155        |
|            | Main Report .....  | 165        |
|            | Appendix 1     Agenda .....  | 206        |
|            | Appendix 2     List of Documents .....   | 209        |
|            | ANNEX 1     Report of the NAMMCO Scientific Working Group on Harbour<br>Porpoises .....  | 211        |
|            | ANNEX 2     Report of the NAMMCO Scientific Committee Working Group on<br>Walruses ..... | 229        |



**REPORT OF THE TWENTIETH MEETING OF THE NAMMCO  
SCIENTIFIC COMMITTEE**

13 – 16 November 2013, Reykjavik, Iceland,

**EXECUTIVE SUMMARY**

The 20<sup>th</sup> meeting of the Scientific Committee (SC) was held in Reykjavik, Iceland, 13 – 16 November 2013. The SC had reports from two NAMMCO SC Working Groups (WG): the NAMMCO Working Group on Harbour Porpoises (Annex 1) and the WG on Walruses (Annex 2); also an Acoustics Report from T-NASS 2007 (SC/20/13) and an analysis of trend in pilot whale abundance from surveys (SC/20/18) contracted by the Secretariat. Additionally there were reports from observers to the IWC, ICES, and ASCOBANS. Other reports and documents were presented and examined under relevant agenda items.

**ENVIRONMENTAL ISSUES**

**Role of Marine Mammals in the Ecosystem**

**Norway**

Norwegian research on the ecology of harp seals in the Barents Sea where they are major top predators was conducted 1996-2006. In terms of biomass, krill was most important (63%) followed by polar cod (16%) and other fish species (10%). Availability of high-energetic food in the northern areas in spring and summer presumably provides the energetic advantage necessary to account for the long migrations of harp seals. Harp seal body condition exhibited a slow increase from 1992 to 2001, where after a significant decrease to a minimum in 2011 occurred. Longer migration routes between the breeding/moulting areas and feeding areas along the ice edge may have contributed to the recently reduced body condition.

In 2012 and 2013, long awaited 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. In 2014 PINRO will give priority to tagging over aerial surveys. Norway will be responsible for the satellite tags. Due to low pregnancy rates and decline in pup production it will be important to focus on harp seal ecology and demographics in the coming years.

**Iceland**

Changes in diet composition and distribution of common minke whales, the most abundant mammalian top predator in the Icelandic continental shelf ecosystem, are consistent with recent environmental changes, including high sea temperatures and distribution of several prey species including sandeel and capelin.

What was initially a NAMMCO Ecosystem Modelling research programme has developed into a much broader project including more general fisheries management considerations and a socio-economic component, but with modelling at the core. It has now been funded from the EU, and includes 29 institutes from 16 countries. Iceland is still one core area, however multispecies modelling in the Barents Sea has been removed.

**SEALS AND WALRUS**

**Harp Seal**

**White Sea / Barents Sea**

At the recent WGHARP meeting a population model fit estimated a total White Sea/Barents Sea harp seal stock 2013 abundance of 1,419,800 (95% CI 1,266,910–1,572,690). The model predicts an increase in the 1+ population of 13% over the next 10 years. Equilibrium catch level is 17,400 1+ animals or an equivalent number of pups, while a catch level of 26,650 1+ animals will bring the population size down to 70% of Nmax with probability 0.8. The Potential Biological Removals (PBR) were estimated to be

40,430 animals, of which 14% should be pups. This catch option indicates a 16% reduction of the 1+ population in 10 years. WGHARP expressed concerns on the high removals and declining population resulting from the PBR estimations, and concluded that the estimated equilibrium catches were the most preferred option. The current equilibrium option is slightly higher than the previous option, given in 2011. This is possibly a result of no, or very low catches in 2012 and 2013.

### **Greenland Sea**

New aerial surveys to assess harp seal pup production were conducted in the Greenland Sea in 2012 and resulted in an estimate of 89,590 (SE 12,310) pups. This estimate is slightly, but not significantly lower than those from similar surveys in 2002 and 2007.

No data used in modelling are older than 5 years and all model runs indicate a substantial increase in the population abundance from the 1970s with a total 2013 abundance of 627,410 (95% CI 470,540–784,280) seals. With current catch level an increase in the 1+ population of 21% over the next 10 years is predicted. The equilibrium catch level is 14,600 1+ animals or an equivalent number of pups (where one 1+ seal is balanced by 2 pups).

Since Greenland Sea harp seals are classified as data rich, ICES now found the Precautionary Approach framework developed for the management of harp and hooded seals appropriate for the population, given that the reference levels reflect the most recent estimate of total population size which is the largest observed to date. When the population is between  $N_{70}$  and  $N_{max}$ , harvest levels may be decided to stabilize, reduce or increase the population, as long as it remains above the  $N_{70}$  level (i.e. 70% of  $N_{max}$ ). A preferred option is to design the total allowable catch (TAC) to satisfy a specific risk criterion (e.g., 80% probability of remaining above  $N_{70}$  over a 10 year period). 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.

New requests to ICES from individual countries would be needed for a new meeting to finish assessments of Barents Sea and Northwest Atlantic harp seals. Preferably such requests should come from Russia and Greenland, respectively. 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.

### **Hooded seal**

#### **Greenland Sea**

During the aerial surveys conducted in the Greenland Sea in 2012, the harp seal was the prime target species but it proved possible to obtain data also on the pup production of hooded seals 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 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  $N_{30}$  (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.

## **Grey seal**

### **Norway**

An age-structured population dynamics model has been developed to assess the Norwegian grey seal population. Model runs indicated an increase during the last 30 years to 8,740 animals in 2011. A total catch of 707 grey seals would maintain the population size at the 2011 level. Norway has decided not to use the model based TAC, but instead continue to use the more conservative 5% of current abundance until a new pup production estimate becomes available. 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 requires that data used in assessments should be updated every 5 years and a boat-based visual survey in Norway started in November 2013, continues in 2014 and 2015, and if possible, a joint survey with Russia of grey seals on the Murman Coast, as these grey seal colonies have not been surveyed since 1991.

### **Iceland**

Grey seals are distributed all around the Icelandic coast. The majority of the population breeds on the west- and northwest shores, with a second high density in the breeding distribution on the southeast coast of Iceland. Seven aerial surveys to estimate pup production in Iceland, have indicated a downward trend in the period 1980 – 2004. In 2005 a new method was applied for the first time counting at least three times on each breeding site. This method has also been applied in 2008 and in 2012. The results indicate a status-quo at the low pup-production reached in year 2002 of about 4,200 animals and just above the minimum population management objective of the Icelandic government, 4,100 1+ animals.

### **Faroe Islands**

Fish farmers kill seals at their farms, in a protective act. Preliminary data for 2012 indicate that the total removal is in excess of one hundred animals.

Satellite tracking has shown that grey seals in the Faroes are very local, although seals migrating from UK waters to the Faroes have been documented. Some of these animals, especially yearlings, could be part of the removals, especially in winter. A genetic study on the population delineation of grey seals in the North Atlantic, which include samples from the Faroes, is still awaited.

The SC **reiterates the recommendation** from SC19 to obtain numbers on total removals (by-catch and catch) for grey seals in Norway, Iceland, and the Faroe Islands.

The SC **recommended** that the WG on Grey and Harbour Seals meet in late winter 2014 or early 2015 to assess the status of all populations, particularly using new abundance estimate data that are available from Iceland and Norway. The meeting should also address by-catch issues (grey seals) in Norway, Iceland, and the Faroe Islands, and a re-evaluation of the Norwegian management plans (which have been already implemented) for grey and harbour seals.

## **Harbour seal**

Aerial surveys in 2011, 2012 and 2013 yielded a new minimum point estimate of 7,081 for the entire Norwegian coast and this is implemented in the 2014 management following the plan reviewed by the SC in 2011.

Aerial surveys of harbour seals in Svalbard in August 2009 and two in 2010 used data from radio-tagged harbour seals together with age distribution data to give corrected total estimates of 1,888 (95% CI 1,660–3,023), 1,742 (1,381–3,549) and 1,812 (1,656–4,418) harbour seals. The low population size, limited spatial distribution and reduced genetic diversity make this population vulnerable to chance events, such as disease epidemics.

## Walrus

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

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

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

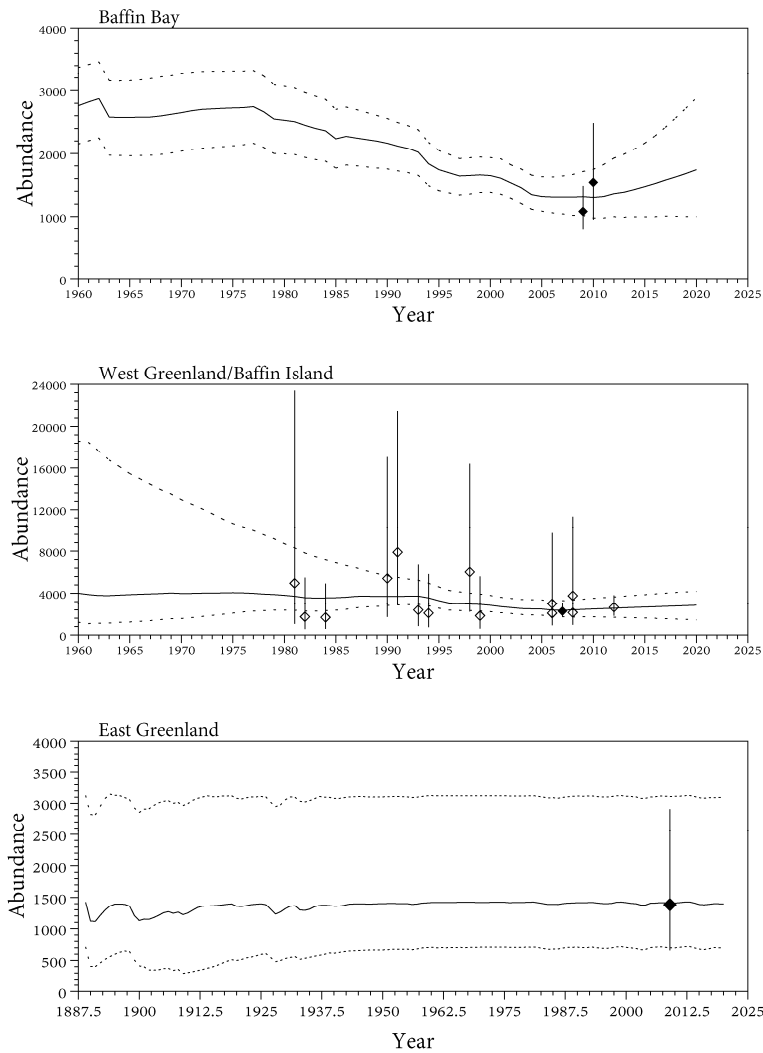
The fit of the model was characteristic of selection for full-grown animals. An exponential model (Fig. 1, top) was considered to best reflect the production in the Baffin Bay population. The overall decline in the population caused by historical catches is unclear due to incomplete catch reporting prior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

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

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

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

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



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

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

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

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

In a walrus survey of Svalbard completed in 2012 an increase in both total numbers and females with calves compared with the 2006 survey is apparent. The study on disturbance at haulouts using cameras

continues. Funding has been acquired for a 2014 tagging project that aims to investigate how individuals are responding to changes in ice conditions.

## **CETACEANS**

### **Humpback whale**

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 the assessment for West Greenlandic waters has been completed, but assessment in other areas not yet initiated. The SC agreed to seek further guidance from the Council on priority of these areas; the SC will then consider this in conjunction with the fin whale meeting.

### **Minke whale**

The commission requested the SC to review the results of the Icelandic research programme on the feeding ecology of common minke whales and multispecies modelling. The programme conducted according to the Special Permit rules of the IWC was in 2013 reviewed at an IWC Expert Panel workshop, and its report, a response paper and updated results, taking into account many of the suggestions of the Panel, were then discussed at the IWC SC meeting. The proponents of the programme considered the review to be positive, fair and constructive. An overview of the IWC review process was presented at the meeting and a short overview of the results of the programme. Future work includes continued development of the multispecies model. The SC **notes** that the quality of the research will be further determined through the peer-review publication process in addition to nine already published articles. The SC draws the attention of the MC to the results from the IWC Expert Panel review process, while **acknowledging** that the IWC review was set according to guidelines set by the IWC, which focused on whether the research can be done using non-lethal means, and the usefulness in IWC assessments. These are not necessarily the same criteria that NAMMCO might use. The SC awaits guidance from the Council concerning potential further review of the results within NAMMCO.

### **Narwhal and beluga**

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 IWC is holding a workshop about the effects disturbance on cetaceans in general in the Arctic in March 2014. The SC noted that this meeting does not make redundant the originally envisaged NAMMCO SC symposium focusing on narwhals and beluga. The SC **recommends** to the Council that this symposium be held in 2015 and awaits further guidance.

### **Bottlenose and killer whales**

Faroese bottlenose sightings data were analyzed together with CODA and SCANS II data. The preliminary designed based estimate for the Faroese block of T-NASS 2007 was 16,284.

A recent increase in catches of killer whales off Tasiilaq in East Greenland (8 on average per year from 2010 to 2012) was reported and the possibility of a high struck and lost rate in this hunt. The SC **noted** higher levels of annual catches (19 on average per year from 2010 and 2012) in West Greenland. Low levels of bottlenose catches were also noted (20 animals). The SC was informed that the recent catch statistics have not been validated and **recommends** that all catch data be validated.

### **Pilot whale**

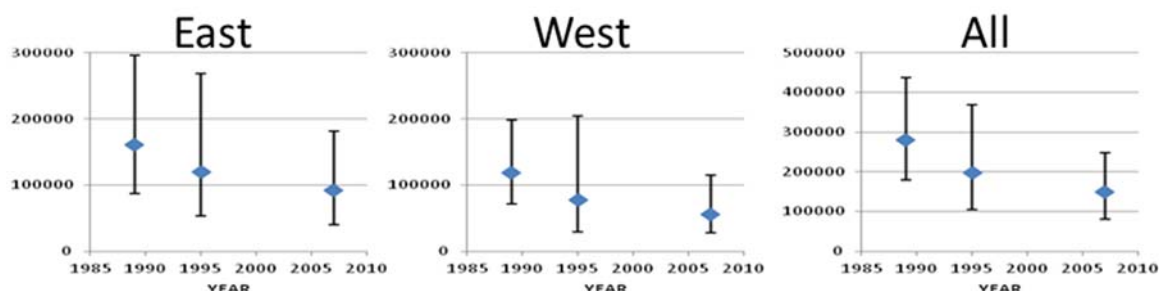
The NASS-T-NASS surveys have indicated decreasing abundance of pilot whales subsequent to the 1989 survey. The NAMMCO SC-17 recommended that an index of relative abundance be developed and applied to the area that is common to all surveys with the aim of determining trends in abundance. In 2011 NAMMCO SC-19 recommended to develop this index using only the three largest surveys and including the data from the CODA survey for enlarging the reference area. The reference area still comprises only a small portion of the summer range of the species and changes in distribution may have influenced the results.

Estimation of pilot whale group size had a strong influence on estimated abundance and varied significantly among the surveys. It appears that the definition of a “group” and the estimation of its size



have changed over the course of the surveys. Other potential biases include differences in survey timing and changes in the number of observers on the primary and combined platforms.

The rate of decline in total number was not significantly different from 0 (Fig. 2) and the abundance of groups did not show a unidirectional trend over time. Although it seems 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 reference areas, which include the hunting area around the Faroes, should be of concern for managers.



**Figure 2.** Pilot whale abundance in the three-survey reference area for the Primary platforms and divided into East and West subregions.

The SC was informed about recent progress in pilot whale tagging in the Faroes and notes that these data are highly valuable and is pleased that tagging will continue. It **recommends** more tracking data from offshore areas, with a focus on the period during sightings surveys (July-August).

### Harbour porpoise

#### Greenland

Two harbour porpoises off West Greenland were tracked for more than a year in order to study distribution and site fidelity and spent on average 83% of their time in offshore areas and had maximum dives down to 382 m and 410 m. not previously documented, and exhibited site fidelity to West Greenland. In agreement with earlier genetics studies, the tagged animals did not indicate any overlap with other stocks and it was concluded that West Greenland should be considered a separate stock and management unit.

An aerial survey conducted in West Greenland in August-September 2007 corrected by tracking data gave abundance estimate of 274,883. Another approach based on data on porpoises instrumented with time-depth recorders in Danish waters resulted in a corrected estimate of 50,461.

There were large increases in catches in the past 19 years in the settlements with the largest catches, which may be due to multiple factors, including improvements in technology (introduction of motorized dinghies), increased harbour porpoise population, and the new reporting system. The catches were corrected based on a questionnaire survey among hunters for missing data on harbour porpoise catches by 1.8. The interview also revealed a struck and lost rate of 8%.

The WG used age-structure data from the hunt and combining the two different availability corrections of the abundance estimate, with three different estimates of the historical catches, the model estimated the dynamics of harbour porpoises in West Greenland quite differently, from increase to rapid decline. Hence, to obtain a consistent assessment model that is useful for providing management advice, it is essential that the uncertainties associated with the abundance and catch history estimates are resolved. Nevertheless, the working group noted that the average annual catches since 1993 in West Greenland were 2,126 harbour porpoises and that a large abundance is needed to sustain such catches.

#### Norway

The two best models to estimate by-catch by coastal monkfish and cod gillnet fisheries gave about 6,900 harbour porpoises taken annually. The mosaic surveys designed for minke whales do not give a reliable abundance estimate for porpoises because they do not cover the coastal habitat of harbour porpoises, and are run in conditions up to (but not including) Beaufort 5. Although no abundance estimate is available for the coastal harbour porpoise population, the annual by-catch is likely not sustainable.

Two options were considered for mitigation: the use of pingers on nets as a porpoise deterrent, or changing the fishery by moving the fleet to waters deeper than 50 m. An experiment is currently running with pingers in Vestfjorden. If the pingers are effective as a deterrent at depths down to 400 m, they will be recommended for use in the large mesh net monkfish fishery. For the cod fishery, further consideration is needed due to the very high fishing effort in the cod spawning area.

Incidental sightings show that the species is commonly observed in near coastal waters, archipelagos and fjord systems along the entire Norwegian coast.

Harbour porpoises have been observed in the southern Barents Sea, including the Pechora Sea (see NPR-R), and a vessel-based survey gave uncorrected estimates of about 3,000 animals. It is known that there is some by-catch in the southern Barents Sea.

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. T-NASS 2015 may provide a new abundance estimate and a new assessment should not be considered until the outcome of this survey is known.

The SC **recommends** that Norway expand the information about by-catch giving the next priority to the lumpfish fishery by-catch; that surveys to estimate abundance in Norwegian coastal and fjord waters are carried out with focus in the areas of highest by-catch (Vestfjorden); that both tracking and genetics studies be carried out to clarify stock delineation; that samples be collected from by-catches, to obtain data on sex ratio, reproductive status, age structure, diet, contaminants, *etc.*

The next meeting of the WG on Harbour Porpoises is deferred until new abundance estimates are available.

### **Bowhead whale**

Aerial surveys were completed in West Greenland in 2012 and a comparison with a simultaneous genetic mark recapture study showed the genetics give higher abundance estimates. The reasons for the higher estimates are that the aerial surveys are snapshots of the situation, whereas the genetics represent a whole influx of bowheads.

## **SURVEY PLANNING**

### **Acoustics**

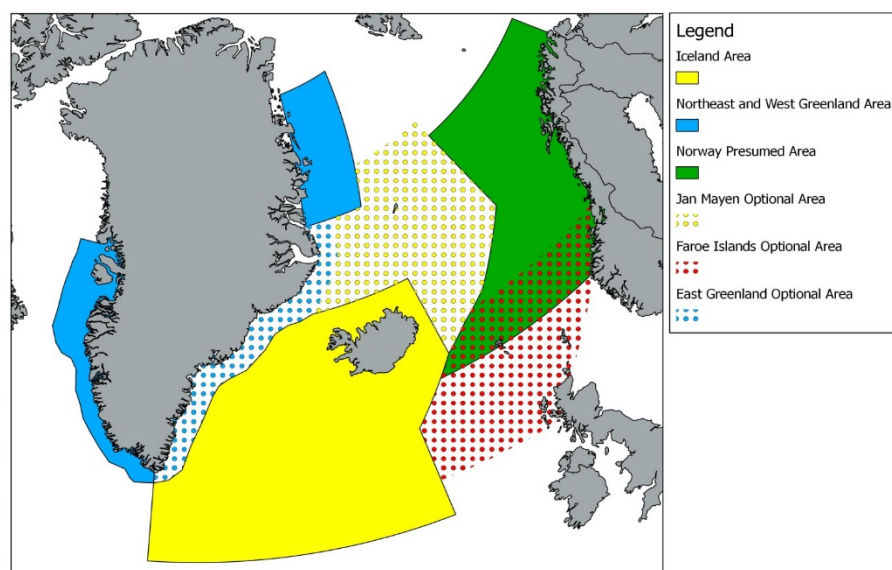
A contracted report on the acoustics data from T-NASS 2007 collected on 4 vessels was reviewed. This was the first broad scale acoustic survey in the North Atlantic. Combined with data from CODA, it represents the largest single dataset collected. There were only 11 detections of sperm whales and it was noted that these are unlikely to result in an accurate estimate to be of value in comparison to an estimate based on 100 sightings. However, it could be interesting to compare acoustic detections with sightings. There was a considerable number of dolphin detections, but further analysis would require additional funding.

Acoustics are not included in the NAMMCO T-NASS 2015 proposal but could be conducted during national survey activities.

## T-NASS 2015

Due to national and international requirements, management decisions on cetacean harvests necessitate scientific advice based on updated abundance estimates. Better basis for the management of cetacean species is obtained through effort coordination aiming at a synoptic and contiguous survey across the whole North Atlantic with identified target species, while at the same time allow for modifications necessary to meet national requirements. Such coordinated surveys could also be useful for detecting trends in distribution and abundance of species for ecosystem monitoring. The specific objectives for the planned T-NASS 2015 are to obtain unbiased abundance estimates of:

- 1) Pilot whales around Faroe Islands - useful for assessing the sustainability of the hunt.
- 2) Minke whales in West Greenland, around Iceland, Jan Mayen and Svalbard and the central Norwegian Sea.
- 3) Fin whales southwest of Iceland.



**Figure 3.** Extension of the proposed T-NASS 2015. The estimated size of the areas is off Northeast Greenland 235,529 km<sup>2</sup>, Jan Mayen 726,044 km<sup>2</sup>, Iceland 2,860,193 km<sup>2</sup>, Norway 934,722 km<sup>2</sup>, Faroe Islands ~768,235 km<sup>2</sup>, East Greenland 233,659 km<sup>2</sup> and West Greenland 225,285 km<sup>2</sup>.

The plans from individual NAMMCO member countries are to conduct local surveys (see Fig. 3 above) in 2015 generally similar to those of the 2007 T-NASS survey. **Greenland** plans to conduct an aerial survey of West Greenland shelf area from Kap Farvel to Uummannaq in August-September 2015, but no ship surveys are planned. **Norway** conducts a series of mosaic surveys covering different part of the North Atlantic each year and will either cover the central Norwegian Sea or the area around Svalbard. The **Faroe Islands** will provide one survey platform. **Iceland** will provide 2-3 survey platforms that will cover the areas traditionally covered by Iceland. National funding contributions in terms of already planned survey effort, including ship-time, are expected to cover about 45 million NOK.

Aside from already planned national survey activities, there are also plans for surveys of cetaceans funded by oil companies in areas where oil exploration is planned (East Greenland approx 2.5 mill NOK) and there are also expected participations from Russia, Canada and other countries (estimated at ~6 million NOK).

For the target species chosen for T-NASS 2015 however, it is desirable to have larger, more coherent survey coverage and an additional 7 million NOK are needed to ensure coverage in areas adjacent to areas surveyed by NAMMCO member countries. These are:

1. Increased survey coverage of potential pilot whale habitat includes design of survey strata based on information on habitat delineation of whales tracked by satellite to ensure that areas with the highest abundance are well covered. Independent estimation of group sizes will be based on aerial photographic counts of pilot whale groups detected by either the ship survey or aerial platform. The survey is then left with the task of counting groups in passing mode. Group size has been a notorious problem in past surveys. Potential cooperation with SCANS-III is also recommended, with the reservation that these surveys are not planned for the same year.
2. Conduct a ship-based survey coverage of the Jan Mayen area with the methods used in the Norwegian mosaic survey design to ensure that this important area is covered simultaneously with areas in the Norwegian Sea and East Greenland and in particular the Icelandic coastal areas from where minke whales may have shifted to the North in recent years.
3. The East Greenland coastal shelf area from Kap Farvel to about 80°N has not been covered in the past due to sea ice, but the area is known to have conspicuous numbers of baleen whales detected by platforms of opportunity in recent years. It should therefore be covered in T-NASS 2015 with an aerial survey conducted in the same way as the surveys in West Greenland in the same year.

Identified areas of secondary importance (not highlighted in Fig. 3) include the offshore areas between the Labrador coast and the shelf areas of West Greenland not surveyed in the past; areas south of the Irminger Sea and generally south of 55°N with respect to sei and pilot whales; areas north of 70°N in West Greenland where recent catches of minke whales have been taken; areas in the north-east Barents Sea, Pechora Sea where Russian surveys have indicated increased presence of cetaceans.

The T-NASS 2015 will be organized by the Steering Committee appointed by the Council with members from the Scientific Committee. Detailed proposals will be reviewed with the plan to forward them to the Council meeting in February 2014 for a final decision on funding.

## **MAIN REPORT**

### **1. CHAIRMAN'S WELCOME AND OPENING REMARKS**

The Scientific Committee (SC) Chair Gunnlaugsson opened the 20<sup>th</sup> meeting of the NAMMCO SC. He welcomed the NAMMCO Scientific Committee members, as well as the observers from Japan and the Russian Federation (Address Section 5.4), to the Marine Research Institute (HAFRO).

### **2. ADOPTION OF AGENDA**

The Draft Agenda (Appendix 1) was adopted with minor amendments.

### **3. APPOINTMENT OF RAPPORTEUR**

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

### **4. REVIEW OF AVAILABLE DOCUMENTS AND REPORTS**

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

#### **4.1 National Progress Reports**

National Progress Reports (NPRs) for 2012 from the Faroe Islands, Greenland, Iceland and Norway were received by the Committee. In addition the SC was pleased to receive progress reports from Canada, the Russian Federation and Japan, and presentations from Japan and Russia at the meeting.

#### **4.2 Working Group Reports**

Reports from two NAMMCO Working Group (WG) meetings were available at the meeting:

- WG on Harbour Porpoises (Annex 1)
- WG on Walruses (Annex 2)

#### **4.3 Other reports and documents**

Several other reports and documents were presented to the meeting and were examined under the relevant agenda items.

### **5. COOPERATION WITH OTHER ORGANISATIONS**

Observer reports from meetings of other organisations were available for consideration and are summarized below.

#### **5.1 IWC**

The 64<sup>th</sup> meeting of the SC of the International Whaling Commission was held in Panama City, Panama from 11-23 June 2012 and the 65<sup>th</sup> meeting in Jeju Island, Republic of Korea from 3-15 June 2013. Vikingsson and Gunnlaugsson attended both meetings as observers for the NAMMCO SC.

#### **The 64<sup>th</sup> meeting of the IWC SC in 2012**

Walløe presented a summary of the 18<sup>th</sup> meeting of the NAMMCO Scientific Committee.

The IWC SC reiterated its interest in monitoring NAMMCO's initiative to implement a series of ecosystem modelling exercises in the Barents Sea and the waters around Iceland.

The IWC SC noted that the NAMMCO Secretariat had indicated interest in organizing and convening a global review of the monodontids jointly with the IWC Scientific Committee and suggested a joint steering committee be established.

The IWC SC recommended that the Implementation Review for North Atlantic fin whales, previously scheduled for 2014, be brought forward to 2013. The Review should start during a pre-meeting immediately before the 2013 annual meeting to ensure that it is completed in one year. An inter-sessional email steering group was established to coordinate the work prior to the 2013 meeting. The committee noted that while the Implementation Review would be focused on providing advice for the Icelandic hunt, the discussions of stock structure would also be valuable in the context of the SWG's work to develop a strike limit algorithm (SLA) for the aboriginal hunt off West Greenland.

The IWC SC agreed in 2011 to conduct an Implementation Review for North Atlantic common minke whales in 2014. Preparations continued at SC/64 and the IWC SC agreed that this will include a full review of stock structure and other issues, recognizing that there had been substantial new information collected over the period since the original hypotheses were developed during the Implementation in 1992.

Preparations for *pre-implementation* of North Atlantic sei whales were initiated at the request of Iceland. An inter-sessional correspondence group was established to oversee this work.

The IWC SC decided that the results from the Icelandic research programme on common minke whales would be subject to final review during the inter-sessional period 2012-2013.

The SC agreed that highest priority within the AWMP working group should be to work towards the development of long-term SLAs for the Greenland hunts:

- (a) Develop trial structures and operating models for the Greenland hunts of bowhead and humpback whales to be presented initially at an inter-sessional Workshop in 2013.
- (b) Develop an AWMP RMP-lite program to assist developers of SLAs for the Greenland hunts of fin and common minke whales; and
- (c) Review a full scientific paper on the work in Greenland related to the collection of information on conversion factors

### **The 65<sup>th</sup> meeting of the IWC SC in 2013**

Walløe presented a summary of the 19<sup>th</sup> meeting of the NAMMCO Scientific Committee.

The new large-scale T-NASS survey with the most optimal year for a large scale coordinated survey is 2015 was highlighted and Norway presented its plans to conduct a new series of annual partial surveys over the period 2014 – 2019 (SC/65a/RMP10).

In accordance with new IWC rules concerning special permit programs, an expert panel meeting took place in February 2013 in Reykjavík to review the results from the Icelandic research program on common minke whales. Thirty papers on the results were submitted to the expert panel meeting (<https://events.iwc.int/index.php/workshops/ISPEPR2013/schedConf/presentations>). A response paper (SC/65a/SP1-rev) to the expert panel report (SC/65a/Rep3) was also submitted and some of the papers were revised and resubmitted to the IWC SC annual meeting where several of the papers were presented to the relevant sub-committees and working groups.

Elvarsson presented a preliminary report (SC65a/EM01) from a multispecies modelling effort to study the role of minke whales in the marine ecosystem around Iceland, in the Gadget statistical framework.

A finalised review of MSYR to be used in trials recommended updating the *Requirements and Guidelines for Implementations under the RMP* with the range  $MSYR_{1+}$  1% to 7%. The Norwegian proposal for amending the CLA (SC/59/RMP4) will be a primary document for the next meeting and other modifications will be considered then.

Considerable progress on developing SLAs and providing management advice for Greenlandic hunts was made as a result of an inter-sessional workshop (SC/65a/Rep2). The Committee noted that it may be possible to base the SLA for fin whales off West Greenland on operating models which considered West Greenland only. This will be investigated further including at the inter-sessional RMP workshop on fin whales.

SC/65a/AWMP07 reported on the collection of weights and length measures from fin, humpback and bowhead whales caught in West Greenland. To increase the reporting rate, the Greenland Institute of Natural Resources has now purchased and distributed weighing equipment that can be fitted to cranes in major towns for the hunters to use for weighing when landing a catch.

Using the interim safe approach in providing advice for the Greenland hunts the limits were repeated 2 strikes of bowhead whales off West Greenland and 164 West Greenland minke whales (down from 178) and 12 for East Greenland (repeat from last year). Also repeated was a strike limit of 19 fin whales and 10 Humpback whales off West Greenland.

Bjørge presented published by-catch estimates for harbour porpoises for the Norwegian coastal fleet.

**Table 1.** Summary of proposed workshops and pre-meeting of special relevance to NAMMCO.

|  |                           |                        |
|--|---------------------------|------------------------|
| Workshop on developing SLAs for the Greenland hunts            | Early January             | Copenhagen, Denmark    |
| Workshop on the North Atlantic fin whale Implementation Review | Early January             | Copenhagen, Denmark    |
| AWMP/RMP NA minke whale stock structure                        | April                     | Copenhagen (or Bergen) |
| North Atlantic common minke whale Implementation Review        | May, Pre-meeting (3 days) | Bled, Slovenia         |

A completion of the Implementation Review for the North Atlantic fin whales is anticipated at the next annual meeting and then to begin a basin-wide stock structure study for North Atlantic fin whales, to be completed in time to inform the next Implementation Review. A Steering Group under Walløe was set up, to ensure that sufficient progress is made on the Implementation Review of North Atlantic minke whales, starting now under the new guidelines. There will also be a review of the information available for North Atlantic sei whales in the context of a pre-implementation assessment.

The NAMMCO Secretariat, with the IWC Scientific Committee as co-sponsor, indicated it can convene a global review of monodontids workshop back-to-back with the joint meeting of the NAMMCO SC Working Group on Belugas and Narwhals and the JCNB, to be held in Copenhagen in the second half of 2014 (or first half of 2015).

Lars Walløe was again appointed as the IWC representative at the next NAMMCO SC meeting.

The NAMMCO SC **noted** that Walløe has not attended the NAMMCO SC meetings for some years, and appoints Nils Øien as NAMMCO observer to the IWC SC meetings.

## 5.2 ASCOBANS

Lockyer reported on two meetings of ASCOBANS.

The **7<sup>th</sup> Meeting of Parties (MOP7)** to the ASCOBANS was held in Brighton, England, 22-24 October 2012 and attended by Lockyer. ASCOBANS holds its MOP only every 3 years, and one of the main matters for consideration and agreement addressed the work plan for the next triennium. Advice had been received from the Advisory Committee (AC) in its report (from its AC19 meeting earlier in March

2012). The implementation of the [Recovery Plan for Baltic Harbour Porpoises \(Jastarnia Plan\)](#) (2002 and updated 2009) and of the [Conservation Plan for Harbour Porpoises in the North Sea](#) are ongoing. The [Conservation Plan for the Harbour Porpoise Population in the Western Baltic, the Belt Sea and the Kattegat](#) was the topic for Resolution (7.1). This resolution covered topics from contaminants to by-catch mitigation and disturbance, in effect to improve environmental quality. NAMMCO was specifically mentioned in one of the resolutions (7.2) dealing with the future work plan, where increased cooperation with other IGOs was invited.

The ASCOBANS Secretariat gave a presentation of a new system that would be implemented, based on the UNEP/CMS-system, where member countries could enter information for the national reports online in a specific format.

At the AC19, ASCOBANS had pledged support for the T-NASS 2015. A 2-page information sheet, not presented as an official document to the meeting, was distributed to all delegations, and a short presentation of the planning process and financing through a newly appointed Steering Committee, and also the description of the areas to be covered in cooperation with non-member states (US and Canada, Russia and the EC countries) in comparison with T-NASS 2007 coverage, was provided. Interest and appreciation of this information was expressed by the members present.

The **20<sup>th</sup> meeting of the ASCOBANS Advisory Committee** was held in Warsaw, Poland, 27–29 August 2013. Lockyer attended as observer from NAMMCO.

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. Several of these focused on the harbour porpoise, and were from different Action Plan groups: the Recovery Plan for Baltic Harbour Porpoises (Jastarnia Plan), the Conservation Plan for Harbour Porpoises in the North Sea (North Sea Steering Group), and Conservation Plan for the Harbour Porpoise Population in the Western Baltic, the Belt Sea and the Kattegat.

The issue of recent large catches of pilot whales and >400 white-sided dolphins in the Faroe Islands was raised. Concern over this was expressed by the AC and the ASCOBANS Secretariat was instructed to write a letter to the Faroes requesting information on these hunts. Lockyer, at this point, fielded off further discussions by informing the AC that NAMMCO was the competent body for providing management advice to the Faroes on such issues regarding sustainability of catches, and that the Faroe Islands would report to NAMMCO on such catches.

Matters concerning the new Agreement extension area and also large cetaceans were discussed following the reports of these two working groups. It was noted that it would be desirable for the Large Cetacean working group to provide information as this could help flag up emerging issues such as ship strikes and entanglement.

The meeting recognized SCANS-III as a priority and the Parties are urged to provide the matching funding needed. Although SCANS-III is not scheduled until 2016, during 2015, a number of trials – mainly experimental survey techniques – will be tested. The project coordinators running SCANS-III were encouraged by the AC to liaise with their counterparts organizing the T-NASS 2015 survey in order to make the results as compatible as possible and exchange expertise.

In the institutional session part of the meeting, of interest to NAMMCO was the introduction and demonstration of an Online Reporting System for ASCOBANS member countries. The topics included in such reporting are comparable to the National Progress Reports in NAMMCO, and as such, the new system may be interesting as a template for NAMMCO when revising its own reporting form format in the future.



The ASCOBANS Coordinator for the [Conservation Plan for Harbour Porpoises in the North Sea](#) (Desportes) was invited to present the Plan and the progress in its implementation at the NAMMCO Working Group on Harbour Porpoises.

### 5.3 ICES AND NAFO

Haug reviewed the 2012 activities in ICES which have some relevance to the work in NAMMCO SC. 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 also sessions entirely devoted to marine mammals.

The next ICES Science Conference will be held 15-19 September 2014 in A Coruña, Spain and there are plans to have a session on top predators and climate change that may be of interest to NAMMCO.

Haug will continue as the NAMMCO observer to ICES.

It was noted that the WGHARP no longer includes NAFO and that there are no other NAFO meetings of relevance to NAMMCO. NAFO activities have usually been reported by Canadian observers to the SC meetings; however no Canadian observer was present at this meeting.

### 5.4 JCNB

A subgroup of the Joint Scientific Working Group of NAMMCO and the JCNB is scheduled to meet in 10–12 March 2014 in Copenhagen to decide on catch allocations of narwhals in Baffin Bay.

## 6. ENVIRONMENTAL ISSUES

### 6.1 Sea Ice Conditions

At NAMMCO/21-2012, the Management Committee **underlined** the serious situation for ice-breeding seals when the extent and quality of sea ice is rapidly changing under the current climate change.

The SC **noted** that changing sea ice conditions will need to be taken into account, and will add to the uncertainties in regard to ice breeding seal assessments. These issues were further discussed in the species updates for harp, hooded and ringed seals, and were also **noted** for walrus.

### 6.2 Role of Marine Mammals in the Ecosystem

#### Norway

Haug reported from recent Norwegian research on the ecology of harp seals in the Barents Sea where they are major top predators (Grahl-Nielsen *et al.* 2011, Lindstrom *et al.* 2013, Øigård *et al.* 2013a). After whelping and moult during spring in the White and southeastern Barents Sea, they disperse to feed, following the receding ice edge and moving northwards in the area. Norwegian studies of their foraging behaviour during this intensive summer feeding period were conducted in the northern Barents Sea in 1996-2006 (Lindstrøm *et al.* 2013). Subadult (<150 cm) and adult seals were observed to feed heavily on pelagic crustaceans (particularly krill) – adult seals also ate fish. In terms of biomass, krill was most important (63%) followed by polar cod (16%) and other fish species (10%). The seals targeted primarily the most lipid-rich prey at this time of the year: krill, followed by other crustaceans and polar cod (see Grahl-Nielsen *et al.* 2011). Other fish species were very lean. Availability of high-energetic food in the northern areas in spring and summer presumably provide the energetic advantage necessary to account for the long migrations of harp seals from their more southerly located winter distributions.

In the Barents Sea the ice coverage is at its minimum in summer and autumn. In recent years, the ice free area of the northern part of the Barents Sea has increased during summer. Additionally, some fish species, such as cod, have extended their range northwards. Could these observed changes in habitat have affected the possibilities for harp seals to restore their blubber reserves during summer feeding? Harp seal body condition, estimated from samples taken during spring in 1992-2011, exhibited a slow

increase from 1992 to 2001, whereafter a significant decrease to a minimum in 2011 occurred (Øigård *et al.* 2013b). Analyses of relevant covariates indicated that high abundance of krill impacted the seal condition positively, emphasizing the ecological significance of krill as key food for harp seals during summer. High abundances of capelin, polar cod and cod had, however, a negative impact on seal condition. A linear correlation between annual pup production and blubber thickness indicated that recently observed declines in pup production may be associated with changes in body condition of the seals. Seemingly, indirect effects such as competition between harp seals and prey for shared resources such as krill, may have resulted in negative effects on condition with subsequent implications for breeding success. Longer migration routes with increased energy expenditure between the breeding/moulting areas and feeding areas along the ice edge may certainly also have contributed to the reduced recent harp seal body condition.

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 and 2013, 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. In 2014 the Russian colleagues in PINRO will again attempt to obtain funding for and carry out both aerial surveys and satellite tagging in the White Sea – if only one of the projects proves feasible, tagging will be given priority over the aerial surveys. During the tagging experiment, PINRO will provide the necessary logistics required for helicopter- or boat-based live catch of seals in April-May 2014. IMR, 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, PINRO scientists must obtain the necessary permissions from Russian authorities before December 2013. The permission from Russian authorities is not dependent on the origin of the transmitters, therefore both US and Russian transmitters can be used. The transmitters cannot collect geographically positioned temperature and salinity data. After the 2014 tagging season future seal tagging will be decided upon following an evaluation of both the tagging methods and the obtained seal movement data set. Due to low pregnancy rates and decline in pup production it will be important to focus on harp seal ecology and demographics in the coming years.

During discussions, Kitakado noted that they are seeing similar declines in blubber thickness in Antarctic minke whales, with differences between sexes. Haug informed the group that they are not seeing differences between the sexes, and are also not seeing decreased body condition in the pups.

Zabavnikov reported that early analysis of data from 2013 ecosystems survey showed that many harp seals were observed in the western part of the Kara Sea, and the final results will be presented later. Little knowledge exists on food conditions for harp seals in the Kara Sea, but the Kara Sea is known to be shallow.

### ***Iceland***

Víkingsson summarized the results from a study on diet composition and abundance of common minke whales in Icelandic waters (Víkingsson *et al.* 2014). According to regular aerial surveys conducted since 1986, the common minke whale is the most abundant mammalian top predator in Icelandic continental shelf waters with an estimated total consumption of around 2 million tons in the mid-1990's. Recent surveys have, however, shown an appreciable decrease in abundance of minke whales in this area. It has been hypothesized that these changes represent a shift in distribution triggered by northward shifts in distribution of important prey species. The results show pronounced spatial and temporal variation in the diet. The temporal changes include a decrease in the proportion of sandeel in the diet over the study period and a corresponding increase in herring and gadoids. The diet also differed markedly from the limited previously available data from Icelandic waters from the period 1977-1997. These changes in diet composition are consistent with recent changes in the Icelandic continental shelf ecosystem

including high sea temperatures and changes in distribution of several prey species including sandeel and capelin. Although natural fluctuations cannot be ruled out at this stage, these dietary changes, together with decreased abundance in coastal waters, may reflect the responses of minke whales to a changed environment possibly driven by global warming.

### 6.3 Other

Vikingsson updated the SC on the Ecosystem Modelling project for which funding was being sought. The initial NAMMCO research program has developed into a much broader project with modelling at the core, including more general fisheries management considerations and a socioeconomic component.

The project has now been funded for 6 million Euros for the next 4 years. The funded project has been adapted for the call for research proposals from the EU, and now includes 29 institutes from 16 countries. It still contains parts of the original marine mammal components. Iceland is still a core area, and the project has been expanded to include many other areas, however multispecies modelling in the Barents Sea has been removed.

The SC **noted** that the original NAMMCO project (coordinated by Lars Walløe) has been changed but the Icelandic component is still included.

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

### 7.1 Harp Seal

#### 7.1.1 Update

Haug and Zabavnikov reported from the ICES Working Group on Harp and Hooded Seals (WGHARP) which met during 26-30 August 2013 at PINRO in Murmansk, Russia (ICES 2013). WGHARP received presentations related to estimates of catch, mortality, abundance, biological parameters and current research of relevance to White Sea/Barents Sea, Greenland Sea and Northwest Atlantic Ocean harp and hooded seal stocks. The WG was also requested to provide catch options for northeast Atlantic harp and hooded seals in response to a September 2012 request from Norway.

#### *White Sea / Barents Sea*

Zabavnikov reported that a pup survey of White Sea/Barents Sea harp seal stock was flown during March 2013, but the results are not yet available. Haug further reported from the recent WGHARP meeting where the population model was fitted to the same pup production surveys and reproductive rate information as used in previous assessments, and with harvest data updated to 2013. The population model estimated a total White Sea/Barents Sea harp seal stock 2013 abundance of 1,419,800 (95% CI 1,266,910 – 1,572,690). At current catch levels, which are essentially 0, the model indicates an increase in the 1+ population of 13% over the next 10 years. Equilibrium catch level is 17,400 1+ animals or an equivalent number of pups (where one 1+ seal is balanced by 2 pups). A catch level of 26,650 1+ animals or an equivalent number of pups will bring the population size down to the N70 level (i.e. 70% of Nmax) with probability 0.8 within 10 years. Since this population is now defined as data poor (reproduction data older than 5 years), also the Potential Biological Removals (PBR) approach was considered. The PBR removals were estimated to be 40 430 animals, of which 14% should be pups. This catch option indicates a 16% reduction of the 1+ population in 10 years. WGHARP expressed concerns on the high removals and declining population resulting from the PBR estimations, and concluded that the estimated equilibrium catches were the most preferred option. The current equilibrium option is slightly higher than the previous option, given in 2011. This is possibly a result of no, or very low catches in 2012 and 2013.

WGHARP has used aerial surveys of pups flown between 1998 and 2010 in the formulation of its advice. Surveys prior to 1998 were surveys to count adults. These surveys were found to have been flown prior to peak pupping, and did not take into account that some females are absent from the ice at different times of the day and under different weather conditions. Therefore unless a correction factor can be developed and applied to the pre-1998 surveys, they are not suitable for providing estimates of abundance of seals in the White Sea.

### ***Greenland Sea***

New aerial surveys to assess harp seal pup production were conducted in the Greenland Sea in 2012 (Øigård *et al.* 2013a). Reconnaissance surveys were flown by helicopter (18 March - 1 April) and two fixed-wing aircrafts (22 March – 1 April) in an area along the eastern ice edge between 67°55' and 74°10'N. The reconnaissance surveys detected two patches of harp seal breeding. The general drift of the two patches were in a south westerly direction. Due to more scattered and loose drift ice in the northernmost patch, this patch drifted faster than the more southern patch. Thus, on 28 March the two patches had merged, yielding one large patch which was photographed by the two aircrafts simultaneously in a high-density coverage. A total of 27 photo transects, spacing 3 nautical miles, were flown using both aircrafts in the area between 70°43'N / 18° 31' - 18° 15' W and 72° 01'N / 17° 29' - 17° 29' W. The survey covered the entire area of the merged patches, and all transects were flown with cameras operated to ensure about 80-90 % coverage of the area along each transect line, resulting in a total of 2,792 photos shot. Analyses of the photos resulted in an estimate of 89,590 (SE = 12,310; CV = 13.7%) pups. This estimate is slightly, but not significantly lower, than estimates obtained in similar surveys of the area in 2002 and 2007.

The Greenland Sea harp seal stock is considered to be data rich (no data used in modelling is older than 5 years). Therefore, it is appropriate to use a population model to estimate abundance and evaluate catch options. All model runs seem to indicate a substantial increase in the population abundance from the 1970s to the present. The population model estimates a total 2013 abundance of 627,410 (470,540 – 784,280) seals. Current catch level indicates an increase in the 1+ population of 21% over the next 10 years. The equilibrium catch level is 14,600 1+ animals or an equivalent number of pups (where one 1+ seal is balanced by 2 pups).

Since Greenland Sea harp seals are classified as data rich, ICES now find the Precautionary Approach framework developed for the management of harp and hooded seals appropriate for the population, given that the reference levels reflect the most recent estimate of total population size which is the largest observed to date. ICES suggest that when the population is between N70 and Nmax, harvest levels may be decided that may stabilize, reduce or increase the population, so long as the population remains above the N70 level (*i.e.* 70% of Nmax). A preferred option is to design the TAC to satisfy a specific risk criterion (*e.g.*, 80% probability of remaining above N70 over a 10 year period). Using this approach, a modelled catch level of 21,270 1+ animals, or an equivalent number of pups (where one 1+ seal is balanced by 2 pups), in 2014 and subsequent years is obtained. 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.

### ***Northwest Atlantic***

Aerial surveys to estimate pup production in the Northwest Atlantic were flown in 2012, but the results for all regions will not be available until the fall of 2013. 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, were similar to those observed in 1969, 2010, and 2011 and are among the worst on record. This has serious implications for the persistence of breeding harp seals in the southern Gulf of St Lawrence.

The NAMMCO SC **welcomed** this work, and **agreed** with the advice of the WGHARP.

#### **7.1.2 Future work**

Haug reported that the ICES Working Group on Harp and Hooded Seals will meet again in May 2014, presumably 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.

There was discussion that new requests to ICES from individual countries would be needed for a new meeting to finish assessments for Barents Sea and Northwest Atlantic harp seals. Preferably such requests should come from Russia and Greenland, respectively.

The SC noted that the previous joint ICES/NAFO WG on harp and hooded seals is now exclusively an ICES WG. Noting the current Letter of Agreement between NAMMCO and ICES on scientific cooperation, the SC advises 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.

## **7.2 Hooded seal**

### **7.2.1 Update**

When WGHARP met during 26-30 August 2013 in Russia, they also considered recent research and provided catch advice on the Greenland Sea stock of hooded seals in response to the September 2012 request from Norway. Additionally, some new information about the northwest Atlantic hooded seal stock was reviewed.

#### ***Greenland Sea***

During the aerial surveys conducted in the Greenland Sea in 2012, harp seal was the prime target species for the surveys since this population is still hunted. Hooded seals have been protected since 2007 due to the low pup production numbers – to assess the effect of protection on the pup production, more than 5 years are needed due to the usually 4–5 years age at maturity observed in the species. If possible, however, it was a secondary goal to obtain also a new abundance estimate for hooded seals in the area during the same survey. Evidently, given the available logistical resources and the priority of harp seals, the possibilities to obtain a hooded seal pup production estimate would require that hooded seal breeding occurred within the same main areas as the harp seal breeding. During the course of the survey, it proved possible to obtain data on the pup production of both harp and hooded seals which were both included in the photo transects run on 28 March. The survey suggests that pup production remains low (13,655 pups, CV=13.8%). These estimates were slightly lower, but not significantly different than estimates obtained from the 2005 and 2007 surveys.

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 showed no significant differences between sampling periods. The pregnancy rate for the total sample was 0.68 (95% CI=0.06). 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  $N_{30}$  (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.

Haug presented a study by Nymo *et al.* (2013) which investigated seroprevalence of *Brucella pinnipedialis* in Greenland Sea hooded seals. Pups (< 1 month) had a substantially lower probability of being seropositive (2.5%, n=159) than yearlings (35.3%, n=17), suggesting that exposure occurs post weaning. For seals older than one year, seroprevalence decreased with age, and there were no seropositives older than five years. No significant relationship was observed between *Brucella*-serostatus and body condition or parity status (based on the presence of corpora albicantia). The authors hypothesise that young hooded seals are likely exposed to *B. pinnipedialis* through prey, with a subsequent clearance of infection.

The NAMMCO SC **welcomed** this work, and **agreed** with the advice of the WGHARP.

### **7.2.2 Future work**

As mentioned under 7.1.2, Haug reported that the ICES Working Group on Harp and Hooded Seals will meet again in May 2014, presumably in Quebec, Canada, to review the status and assess the catch potential of hooded seals in the Northeast Atlantic.

## **7.3 Ringed seal**

### **7.3.1 Update**

#### ***Norway***

Lydersen informed the SC about ongoing tagging of ringed seals using various combinations of satellite tags and sensors that were deployed on males and females of different age classes. Data collection ended this summer and analysis is underway.

#### ***Canada***

It was noted that the NPR from Canada contains updates on ringed seal research including research on ringed seal foraging behaviour and the effect of changing ice conditions on breeding behaviour.

#### ***Faroe Islands***

Mikkelsen informed that 2 yearlings have been seen in the Faroes in the last 5 years.

### **7.3.2 Future work**

**R 2.3.1 NAMMCO/5 02-1995 (Standing):** To advise on stock identity of ringed seals (*Phoca hispida*) 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 05-1997 (Standing):** 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.

The SC **noted** that there is currently very little information on stock structure and stock size to consider in relation to both requests. 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.

## **7.4 Grey seal**

### **7.4.1 Update**

**R-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.

#### ***Norway***

Haug reported that an age-structured population dynamics model had been developed to assess the Norwegian grey seal population (Øigård *et al.* 2012). The model is of a Bayesian character in the sense that priors for various parameters were used. It includes total pup production, estimated by-catch mortality rates and catch statistics, while age specific pregnancy rates were derived from studies in other areas. Model runs indicated an increase in the abundance of the total Norwegian grey seal population during the last 30 years, suggesting a total of 8,740 (95% CI 7,320-10,170) animals in 2011. A total catch of 707 (95% CI 532-882) grey seals would maintain the population size at the 2011 level.

Pup production estimates used in the model were obtained in three periods: 1996-1999, 2001-2003 and 2006-2008. In management of the species, Norway has decided not to use the model based TAC, but instead continue to use the more conservative 5% of current abundance until a new pup production estimate becomes available.

### ***Iceland***

Grey seals are distributed all around the Icelandic coast. The majority of the population breeds on the west- and northwest shores, with a second high density in the breeding distribution on the southeast coast of Iceland. Seven aerial surveys to estimate pup production in Iceland, have indicated a downward trend in the period 1980 – 2004, about 3% ( $\pm 1\%$ ) annually. In the period 1990 – 2002, this downward trend doubled to about 6% annually. In year 2005 a new method was applied for the first time counting at least three times on each breeding site and correcting for double counting with a weaning O-give, and with staging when possible. This method has also been applied in 2008 (and 2009 a re-survey of only a part of the coast due to bad weather the year before) and now in year 2012. The results indicate a status-quo in the low pup-production reached in year 2002. The population size of the Icelandic grey seal is therefore not increasing significantly, but is rather staying at the low levels reached in 2002 (about 4,200 animals) and just above the minimum population management objective of the Icelandic government, 4,100 1<sup>+</sup> animals.

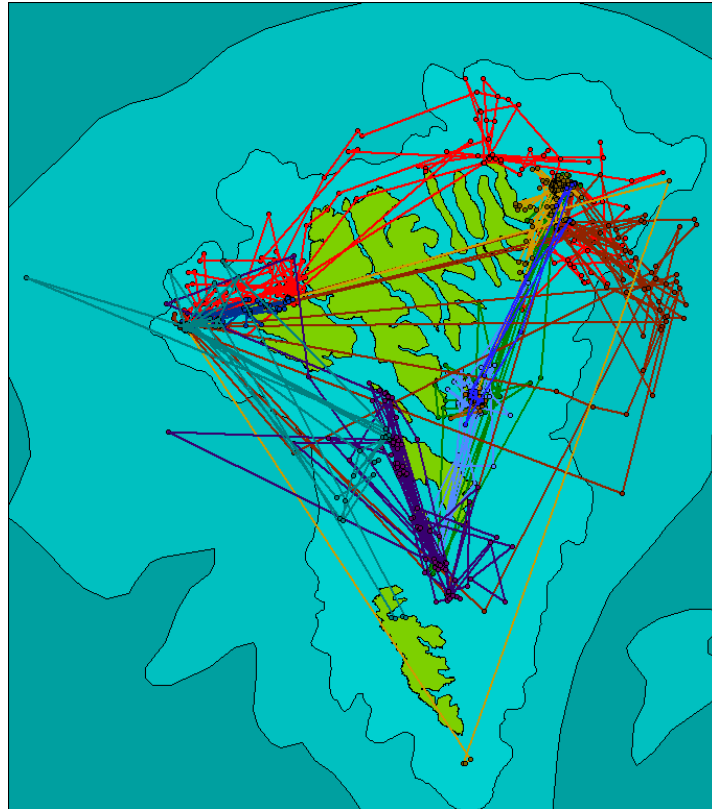
### ***Greenland***

No new information to report.

### ***Faroe Islands***

Mikkelsen informed about progress made in the Faroes in response to the standing request listed above (R-2.4.2). No attempt has yet been made to estimate the abundance. Fish farmers that kill seals at their farms, in a protective act, have been asked to deliver removal statistics on an annual basis. However some farmers still have not introduced a sufficient reporting system. Preliminary data for 2012 indicate that the total removal is in excess of one hundred animals, with highest removals during winter.

Satellite tracking has shown that grey seal movements in the Faroes are very local (Fig. 1), however seals migrating from UK waters to the Faroes have been documented. Some of these animals, especially yearlings, could be part of the removals, especially in winter, but this is unknown. The results from a genetic study on the population delineation of grey seals in the North Atlantic, which include samples from the Faroes, are still awaited.



**Fig. 1.** Satellite tracks from grey seals tagged in the Faroe Islands.

#### **7.4.2 Future work**

##### ***Norway***

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 will therefore start in November 2013 (covering the northernmost parts of Norway), and continue in 2014 and 2015. If possible, Russia and Norway will conduct a joint survey of grey seals on the Murman Coast- these grey seal colonies has not been surveyed since 1991.

##### ***All Areas***

The SC **reiterates the recommendation** from SC19 to obtain numbers on total removals (by-catch and catch) for grey seals in Norway, Iceland, and the Faroe Islands.

The SC **recommended** that the Grey and Harbour Seals WG meet in late winter 2014 or early 2015 to finalise the **requests 2.4.2 and 2.5.2**. The WG meeting should assess the status of all populations, particularly using new abundance estimate data that are available from Iceland and Norway. The meeting should also address by-catch issues (grey seals) in Norway, Iceland, and the Faroe Islands, and a re-evaluation of the Norwegian management plans (which have been already implemented) for grey and harbour seals. It will also be advisable to include participation from at least Canada, UK, and the Baltic Sea countries.

#### **7.5 Harbour seal**

##### **7.5.1 Update**

**R-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. The Management Committee agreed to change the geographical focus of this request to entail ALL areas. (NAMMCO 19)



### **Norway**

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. This has yielded a new minimum point estimate of 7,081 for the species for the entire Norwegian coast. This new estimate is implemented in the 2014 management of the species – this management now follows the management plan reviewed by NAMMCO SC in 2011.

Lydersen reported from an aerial survey of harbour seals in Svalbard (Merkel *et al.* 2013) -

#### **Abstract**

This study presents the first abundance estimate for the world's northernmost harbour seal population, which resides in Svalbard, Norway, based on three digital stereoscopic photographic surveys conducted in 2009 and 2010. The counts from these high resolution 3D images were combined with a novel method for estimating correction factors for animals that were in the water at the time of the surveys, in which extensive behavioural data from radio-tagged harbour seals were used together with age distribution data to estimate the proportion of seals of various age and sex classes hauled out at the times of the surveys. To detect possible seasonal shifts in age distribution between surveys, lengths of hauled out seals were measured from the stereoscopic images. No such length differences were detected; but, this may be due to a high degree of sexual dimorphism exhibited in this population. Applying the modelled correction factors, a total of 1,888 (95% CI: 1,660-3,023), 1,742 (1,381-3,549) and 1,812 (1,656-4,418) harbour seals were estimated for the surveys flown on 01 August 2009, 01 August 2010 and 19 August 2010, respectively. The similarity between the three survey estimates (despite significant differences in the number of animals actually counted on the photos from each survey effort) suggests that the variation in numbers of hauled out seals is reasonably accurately adjusted for by the haul-out probability model. The low population size, the limited spatial distribution of the population and its reduced genetic diversity make this population vulnerable to chance events, such as disease epidemics.

Additionally, data from 60 SRDLs from harbour seals in Svalbard are currently being analysed as part of a PhD thesis.

### **Iceland**

The result of the sixth comprehensive seal count in Vatnsnes peninsula on 22nd of July 2012 resulted in a count of 618 harbour seals, considerably fewer than in 2011 when the result was 1033 seals (Granquist and Hauksson 2011).

### **Greenland**

Updates are presented in NPR-G. It was reported that females with pups were observed on a new haulout site south from Nuuk, in the municipality of Sermersooq in 2010, and information about a new one further south was obtained in 2012.

## **7.5.2 Future work**

### **Norway**

Haug reported that biopsy sampling of tissue from pups for genetic studies will continue on the Norwegian coast in 2014. The aim of such sampling is to assess the population structure of the species using DNA analyses.

See Item 7.4.2 for the SC **recommendation** for a Coastal Seals Working Group meeting.

## **7.6 Bearded seal**

### **7.6.1 Update**

Lydersen reported that 7 GPS tags have been deployed, but results are not ready for reporting yet.

Greenland reported that 2 bearded seals have been tagged.

### **7.6.2 Future work**

The tagging projects in Norway and Greenland are ongoing studies.

## **7.7 Walrus**

### **7.7.1 Update**

#### ***Walrus Working Group***

The SC WG on walrus met 8-10 November 2013 in Copenhagen to update assessments and to provide management advice for the three stocks of walrus that occur in Greenland. The WG also considered a request from Council (**R-2.6.6**) to investigate the possibility to carryover unused quota between years.

#### ***Stock Structure***

The three stocks of walrus are: 1) Walruses in Baffin Bay, which occur mainly in the North Water area around Qaanaaq, Smith Sound and the fjords on east Ellesmere Island including Jones Sound 2) Walruses in West Greenland / Baffin Island that occur in West Greenland in winter and along the coast of East Baffin Island during summer, and 3) Walruses in East Greenland that occur year-round along the eastern coast of Greenland, mainly north of Scoresby Sound.

A total of 35 walruses during 2010-2013 were instrumented with satellite-linked transmitters in Smith Sound, Northwest Greenland. The tags transmitted from 3 to 125 days and identified movements. Thirty-two of the walruses moved to Canadian waters in July, with 6 entering Jones Sound, and they returned to Greenland in November, where they stay until spring. The tagging provided correction factors for aerial surveys, and it occurred in spring to coincide with aerial surveys.

#### ***Catch Statistics***

Reported catches since 1993 from three stocks are given in Table 2. The Baffin Bay stock is hunted in the Qaanaaq area and in Grise Fjord, Canada. The West Greenland / Baffin Island stock is hunted in West Greenland and around 4 settlements in Canada (Qikiqtarjuaq, Clyde River, Iqaluit, Pangnirtung). East Greenland walruses are hunted only in East Greenland.

**Table 2.** Reported catches of walrus. NR= not reported, NA= not available

| Year | Qaanaaq Area | Grise Fjord | West Greenland | Qikiqtarjuaq | Clyde River | Iqaluit | Pangnirtung | East Greenland |
|------|--------------|-------------|----------------|--------------|-------------|---------|-------------|----------------|
| 1993 | 265          | 12          | 241            | 0            | 0           | 29      | 0           | 15             |
| 1994 | 156          | 24          | 270            | 5            | 0           | 26      | 40          | 10             |
| 1995 | 128          | 5           | 265            | 16           | 0           | 25      | 8           | 11             |
| 1996 | 122          | 8           | 176            | 0            | 1           | 9       | 2           | 7              |
| 1997 | 74           | 12          | 155            | 3            | 0           | 0       | 16          | 1              |
| 1998 | 72           | 11          | 139            | 0            | 1           | 27      | 4           | 7              |
| 1999 | 101          | 5           | 184            | 0            | 0           | 15      | 3           | 10             |
| 2000 | 126          | 4           | 196            | 0            | 0           | 19      | 15          | 7              |
| 2001 | 171          | 2           | 162            | 1            | 1           | 7       | 19          | 10             |
| 2002 | 147          | 3           | 150            | 33           | 0           | 1       | 9           | 34             |
| 2003 | 160          | 7           | 113            | 1            | 0           | 1       | 15          | 11             |
| 2004 | 90           | 5           | 100            | 0            | 2           | NR      | NR          | 4              |
| 2005 | 78           | 2           | 158            | NR           | NR          | 10      | NR          | 16             |
| 2006 | 67           | 5           | 73             | 9            | 1           | 9       | 15          | 5              |
| 2007 | 80           | 4           | 43             | 6            | 0           | 11      | NR          | 10             |
| 2008 | 66           | NR          | 28             | NR           | NR          | NR      | 10          | 9              |
| 2009 | 90           | 7           | 33             | NR           | NR          | 14      | NR          | 4              |
| 2010 | 60           | 2           | 40             | 6            | NR          | 14      | NR          | 7              |
| 2011 | 42           | 4           | 50             | 5            | 0           | 14      | NR          | 5              |
| 2012 | 76           | NA          | 34             | NA           | NA          | NA      | NA          | 4              |
| 2013 | 62           | NA          | NA             | NA           | NA          | NA      | NA          | NA             |

Hunters in Greenland are required to fill out a “special form” (*Særmeldingsskema*) which, among other things, requests information on gender.

In Qaanaaq (Baffin Bay stock) there appears to be no bias in the hunter reports on gender, and reports from 2007–2013 were used to derive a weighted average of 39% (SD=8.5) females. The assessment for this stock applied an even sex ratio except for the years since 2007 where the reported sex ratios were used.

Greenlandic regulations forbid hunting of mature females and calves (except the Qaanaaq area). It is likely that the gender reported in the “special forms” in West Greenland is affected by this regulation, with the reported sex being biased towards males. Genetics on samples from 1988 to 2007 estimated a female fraction of 0.59 (Andersen *et al.* 2013), which was applied to catches after 1988 in the assessment for West Greenland/Baffin Island.

All walrus caught in East Greenland from 2011 to 2013 were males, in agreement with an earlier estimate of 10% females (Born *et al.* 1997), as assumed in the assessment for East Greenland.

A review of Canadian catch history was also available (SC/20/WWG/O06), but not discussed in detail.

Each assessment model includes a low and a high catch history. The low catch history does not include struck and lost animals, whereas the high catch history includes struck and lost. This results in an average loss rate about 15% for Baffin Bay and West Greenland/Baffin Island, and about 11% for East Greenland.

The SC recognizes that the loss rates used in the assessment may be lower in some areas and in some types of hunts, but more information is required before the rates can be adjusted. Complete statistics on total removal levels is critical and the SC **strongly recommended** that Greenland obtains reliable reports of all animals struck and lost.

### ***Abundance and Trends***

#### ***Baffin Bay***

Two abundance estimates (1,238 CV=0.19 for 2009 and 1,759 CV= 0.29 for 2010) presented in Heide-Jørgensen *et al.* (2013b) are not statistically different from each other, and it was agreed that the two estimates should be treated separately for the assessment. They were obtained from a multi-species survey. This may affect the perception bias for walrus, but following discussion it was agreed that the method was acceptable given the data available. The applied correction factors were derived from animals tagged in the North Water (SC/20/WWG/04).

#### ***West Greenland/Baffin Island***

An estimate of absolute abundance of 2,500 (CV=0.17) was obtained from haulout counts from southeast Baffin Island (Stewart *et al.* 2013a).

Three estimates (1,100 CV=0.31 for 2006, 1,140 CV=0.48 for 2008, 1,410 CV=0.22 for 2012) from aerial winter surveys in West Greenland (Heide-Jørgensen *et al.* 2013a) were used as a time series of relative abundance in the assessment. These estimates assume that animals on ice were constantly available, whereas animals in the water have a correction factor for availability. The detection depth for animals in the water was assumed down to 2 m. There are no area-specific correction factors for animals that were submerged, so correction factors from the North Water were used.

The assessment included also an earlier time series (1981 – 1999) of densities of walrus wintering in West Greenland between 66°15 and 68°15 N (SC/17/WWG/04) to provide trend information on a longer time scale.

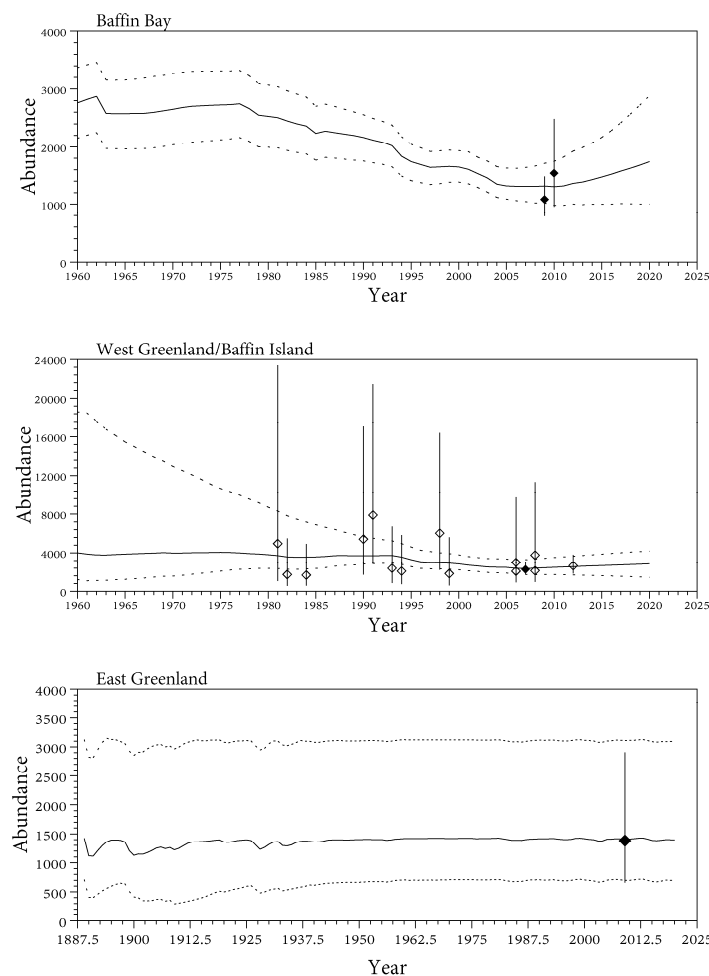
#### ***East Greenland***

There was no new information from East Greenland, and the 2009 estimate of 1,430 (CV=0.45) for East Greenland was used in the assessment (SC/17/WWG/07).

### Assessment

The historical and current dynamics of the three walrus populations were estimated in SC/20/WWG/05 using age- and sex-structured population models with exponential growth, density-regulated growth and selection-delayed dynamics. These models were integrated with the agreed catch data in a Bayesian framework, where the likelihood of the simulated population trajectories were evaluated from the agreed abundance estimates and 376 aged walrus caught in Qaanaaq between 1987 and 1991.

The fit of the model to the age-structured data from Qaanaaq showed an under-representation of animals younger than ten years in agreement with a hunt that takes mainly adult animals. The estimated selectivity is steep and concave, characteristic of selection for full-grown animals, with selection against animals that are almost but not yet fully grown.



**Figure 2.** Projections of population models for the three walrus stocks in Greenland, together with absolute (solid diamond) and relative (open diamond) abundance estimates, with 95% confidence intervals. The solid curves are median projections, and the dashed curves span the 95% credibility interval.

The overall decline in the Baffin Bay population caused by historical catches is unclear due to incomplete catch reporting prior to 1950s. An exponential model (Figure 2, top) was considered the best to reflect the production in the population. It estimated that the population declined by 63% from the 1960s to 2007, and decreased catches (~140 to ~70) have subsequently allowed this population to increase. The 2014 abundance estimated by the model was 1,430 (95% CI: 999-2,170) with an annual

natural growth rate of 7.7% (95% CI: 6.4-9.5%) and a replacement yield in 2014 of 120 (95% CI: 73-180) walruses.

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

A 2014 estimate of 1,400 (95% CI: 720-3,200) walruses in East Greenland has apparently recovered relative to 1888, the year prior to our first historical catches by European sealers. The historical trajectory is uncertain. Density regulation estimates a relatively flat trajectory (Figure 2, bottom), with a maximum depletion in 1890 to 80% of the initial abundance, and a slow continuous increase to almost no current growth. A recovered population was also estimated by selection-delayed dynamics providing a continued increase and a historical depletion to 3% in 1957.

Updated abundance estimates for West Greenland, and modelling with age-structured data from Baffin Bay, have improved the status estimates for Baffin Bay and West Greenland/Baffin Island.

### ***Sustainable Harvest Levels***

The estimated trade-offs between total removals and the probability of population increase is shown in Table 3 for the Baffin Bay and the West Greenland/Baffin Island populations. A target of a 70% probability for increasing populations from 2014 to 2018 results in **recommended** total removals of no more than 93 animals from the Baffin Bay population and no more than 100 animals from the West Greenland/Baffin Island population.

**Table 3.** The estimated probabilities of increasing populations from 2014 to 2018 for 6 levels of annual removal from the Baffin Bay and West Greenland/Baffin Island stocks. Canadian and Greenlandic catches and struck and lost walruses are assumed to be included in removals. These removals do not assume a specific sex ratio.

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

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

### ***Carryover of unused quotas***

**R-2.6.6** The Management Committee requested the Scientific Committee to investigate the possibility to include a carryover for quotas in order to include this possibility in the next hearing for the new quota block period.

The SC discussed that the WG was not specific in their advice regarding carryover of quotas. The SC was informed that this issue was discussed at length by the WG, but it was deemed difficult for the group to give more specific advice without a more specific request from the Management Committee.

## Recommendations for Research

The SC **recommends**:

- 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.
- That regular abundance estimates (5-10 years) from Baffin Bay, West Greenland, and the southeast coast of Baffin Island are obtained.

The SC agrees with the **recommendations** of the WG of total removals of no more than 93 animals from the Baffin Bay population, no more than 100 animals from the West Greenland/Baffin Island population, and no more than 20 individuals from the East Greenland population.

The SC **concluded** that there is no biological argument against carryover of unused quotas. A problem arises if carryovers accumulate over time and/or across assessments.

With regards to **R- 2.6.3 NAMMCO/15 03-2006** (regarding the effect of human disturbance on walrus distribution, behaviour, and conservation status), the SC **noted** that there is no new information available to consider this request.

### **7.7.2 Future work**

Greenland plans to conduct an aerial survey of walrus on the ice edge in the North Water in April 2014.

Lydersen informed that a walrus survey of Svalbard was completed in 2012. The results are not yet complete; however an increase in both total numbers and females with calves compared with the 2006 survey is apparent. The study on disturbance at haulouts using cameras continues. There is cooperation with Russian scientists on tagging studies. Funding has been acquired for 2014 for a project that will use tags with GPS positions that will be downloaded to stations on shore. This study aims to investigate how individuals are responding to changes in ice conditions.

Lydersen reported that Russian scientists have collected skin biopsies from animals in the Pechora Sea in order to clarify the relationship of these walrus to those in Svalbard.

Zabavnikov reported that there is a new study of walrus in the Pechora Sea related to oil and gas exploration and extraction.

Iceland and the Faroes both noted that there have been a higher than usual number of visits from walrus in 2013.

## **8. CETACEANS STOCKS - STATUS AND ADVICE TO THE COUNCIL**

### **8.1 Fin whale**

#### **8.1.1 Update**

##### ***Iceland***

Catch limits for fin whales in Icelandic waters are based on management advice provided by the SC of NAMMCO and the work of the SC of IWC using its Revised Management Procedure (RMP). The latest advice was for an annual catch of 154 whales in the West Iceland area and applies for the period 2011-2015. The Marine Research Institute (MRI) has already provided advice for the years 2014 and 2015 in accordance with this advice from NAMMCO. No catches of fin whales were taken in 2011 and 2012

but 134 animals were taken in 2013. The catches taken during 2011-2013 amount to 29% of the TAC set for this period and 17% of the NAMMCO advice for the five year period (2011-2015).

In 2013 the SC of the IWC initiated a RMP implementation review for North Atlantic fin whales. The review could not be completed as planned in 2013 and will be finalized in 2014. The SC agreed changes to the range of MSYR to be applied in the RMP. These changes required time consuming re-programming which is still underway within the IWC. Until these are finalized, there is no point in carrying out re-runs of RMP with 0.6 tuning level recommended by the NAMMCO SC. 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.

### ***Greenland***

No new information.

### **8.1.2 Future Work**

The Working Group on Large Whale Assessments will meet before the next SC meeting.

## **8.2 Humpback whale**

### **8.2.1 Update**

#### ***Norway***

Lydersen informed about a Marine Mammal Sighting Database for Svalbard operated by the Norwegian Polar Institute. The purpose is to get tourists, scientists and other people that travel in the area to report sightings of marine mammals including polar bears. This reporting system has been operating for 7 years. Of the many observations, one special case of a completely white humpback whale is reported in Lydersen *et al.* (2013).

This white humpback whale was observed on several occasions off Svalbard, Norway, during August 2012. The animal was completely white, except for a few small dark patches on the ventral side of its fluke. The baleen plates were light-coloured, but the animal's eyes had normal (dark) colouration. This latter characteristic indicates that the animal was not an albino; it is a leucistic individual. The animal was a full-sized adult and engaged in "bubble-feeding" together with 15-20 other humpback whales each time it was seen. Subsequent to these sightings, polling of the marine mammal science community has resulted in the discovery of two other observations of white humpback whales in the Barents Sea area, one in 2004 and another in 2006; in both cases the observed individuals were adult animals. It is likely that all of these sightings are of the same individual, but there is no genetic or photographic evidence, so this suggestion cannot be confirmed. The rarity of observations of such white individuals suggests that they are born at very low frequencies or that the ontogenetic survival rates of the colour morph are low.

#### ***Iceland***

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 assessment in other areas and agreed to seek further guidance from the Council regarding that aspect of the request.

### **8.2.2 Future Work**

If the Commission considers request **3.2.4** a priority, the SC will consider this request in conjunction with the fin whale meeting.

## **8.3 Sei whale**

### **8.3.1 Update**

**R-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.

There is no new information available with regards to this request.

### **8.3.2 Future Work**

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.

## **8.4 Minke whale**

### **8.4.1 Update**

#### ***Greenland***

Greenland reported that 3 minke whales were tagged this summer. This is ongoing research, and results will be presented at a later date. The main purpose of the study is to get surfacing time for correction factors for T-NASS 2015.

#### ***Iceland***

The tagging program is continuing, but there has been no successful tracking so far this year. Continued collection of samples was conducted from commercially caught animals. It was noted that there have been low densities of minke whales in the Icelandic coastal areas in recent years.

#### ***Norway***

The mosaic survey for 2008 – 2013 has been completed. Data analysis is underway, and the aim is for the analysis to be completed in time for the IWC implementation review next year.

### **8.4.2 Request from Council to review Iceland Minke Whale Program**

**R-1.1.6** The Commission requested the Scientific Committee to review the results of the Icelandic programme on the feeding ecology of minke whales and multi-species modelling as soon as these become available.

The commission had requested the SC to review the results of the Icelandic research program on the feeding ecology of minke whales and multi-species modelling as soon as these become available (NAMMCO 16). Vikingsson presented a short overview of the results from the Icelandic common minke whale research program conducted according to the Special Permit rules of the IWC. These results had been presented and reviewed at an Expert Panel workshop held in Reykjavík during 18-23. At the workshop, 30 scientific papers from the research program were presented to a specialist panel (<https://events.iwc.int/index.php/workshops/ISPEPR2013/schedConf/presentations>).

The papers covered the multiple objectives of the study, including feeding ecology (stomach contents, stable isotope ratios, fatty acid profiles), energetics, multi-species modelling, biological parameters, satellite tagging, distribution and abundance, genetics, pollution, parasites and pathology. The report from the workshop (SC/20/10) and a response paper (SC/20/11) was discussed at IWC 65a in June 2013 and the diverse results from the program were discussed in the relevant sub-committees of the IWC. These reports were briefly summarized at NAMMCO SC/20.

An overview of the IWC review process was presented (SC/20/10). The SC **notes** that this was a useful presentation for knowing more about how the review was conducted and also notes that the quality of the research will be further determined through the peer-review publication process. The SC also **acknowledged** that the IWC review is set according to guidelines set by the IWC for the reviewers — for example, reviewers focused on whether this research can be done using non-lethal means, and how



these data can be used in assessments. These are not necessarily same criteria that NAMMCO might use.

The SC draws the attention of the MC to the results from the IWC Expert Panel review process and the abovementioned papers and reports detailing the results from the program. The SC awaits guidance from the council concerning potential further review of the results within NAMMCO.

#### **8.4.3 Future Work**

The review of the Expert Panel constituted the formal conclusion of the research program within the IWC. The proponents of the program considered the review to be positive, fair and constructive. Many of the suggestions of the Panel have already been taken account of in a response paper and revised documents submitted the annual meeting of the IWC SC. Future work will include continuation of the development of multi-species model for Icelandic waters and publication of the results in peer reviewed journals in addition to the nine already published articles.

### **8.5 Narwhal**

#### **8.5.1 Update**

##### ***Greenland***

A variety of studies are ongoing. In East Greenland, multi-year tagging study is underway, however no data is available to present yet. The tagging study will provide background studies for research on the effects of seismic exploration.

#### **8.5.2 Future Work**

In Greenland there are plans for continued monitoring of Melville Bay abundance, more direct studies of the effects of seismic exploration, and continued tracking of narwhals in different stocks.

A subgroup of the Joint Scientific Working Group of NAMMCO and the JCNB is scheduled to meet in 10–12 March 2014 in Copenhagen to decide on catch allocations of narwhals in Baffin Bay. The TOR are under Agenda Item 13.3.

Relating to **Request 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:

In 2011, the SC proposed a symposium on beluga and narwhals in relation to disturbance and industrial activities. The IWC is holding a workshop about the effects disturbance on cetaceans in general in the Arctic March 2014. The SC **noted** that this meeting is not redundant with respect to the originally envisioned NAMMCO SC symposium focusing on narwhals and beluga. The SC **recommends** this symposium to be held in 2015 to the Council and awaits further guidance from Council before proceeding with the planning.

### **8.6 Beluga**

#### **8.6.1 Update**

##### ***Norway***

Lydersen updated the SC on a new beluga project in Svalbard started in 2013. This study will include satellite tracking and investigations of health status and pollutants.

##### ***Greenland***

There is currently no dedicated research, but there were a few kills in East Greenland (Scoresby Sound) and samples were collected.

#### **8.6.2 Future Work**

Norwegian studies in Svalbard are ongoing.

See Agenda Item 8.5.2 regarding **R-3.4.9** and a proposed symposium on beluga and narwhals in relation to disturbance and industrial activities.

## **8.7 Bottlenose whale**

### **8.7.1 Update**

#### ***Norway***

Experiments with low frequency sonar are in progress in Norway.

#### ***Iceland***

Iceland is investigating increases in strandings during seismic experiments close to Iceland.

#### ***Faroese***

Mikkelsen reported that Faroese sightings data were analysed together with CODA and SCANS II data in a working document presented to IWC (IWC SC/63/SM13). The preliminary designed based estimate for the Faroese block of T-NASS 2007 was 16 284 (CV=0.41)

#### ***Greenland***

From the catch statistics in the NPR-G appendices, low levels of catches were noted (20 animals). The SC **recommends** that these catch statistics be validated, since to our knowledge there have not been confirmed catches since the 1950s.

### **8.7.2 Future Work**

#### ***Faroe Islands and Iceland***

Analyses of diet data from the Faroes catches in the period 1987-2009 and Icelandic strandings from 1993-2001 are ongoing.

## **8.8 Killer whale**

### **8.8.1 Update**

#### ***Greenland***

SC/20/20 reported on a recent increase in catches of killer whales off Tasiilaq in East Greenland (8 on average per year from 2010 to 2012). Samples have been collected, and genetics indicate that these animals are related to Norwegian herring-eating killer whales (Foote *et al.* 2013). However, only marine mammals (including harp seal pups, and bearded seals) have been found in the stomachs of caught whales. The authors also report the possibility of a high struck and lost rate in this hunt.

The SC **noted** higher levels of annual catches (19 on average per year from 2010 and 2012) also in West Greenland. The SC was informed that the recent catch statistics on killer whales in West Greenland have not been validated. As for bottlenose whales, the SC **recommends** that all catch data on killer whales are validated before the next SC meeting, so that it is possible for the SC to monitor the development of the hunt.

#### ***Iceland***

During the winter of 2012-2013, 60,000 tons of herring died of oxygen shortage inside a small fjord in West Iceland. The reasons for this catastrophic event are under investigation, including possible contributions of killer whales.

### **8.8.2 Future Work**

**R-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.

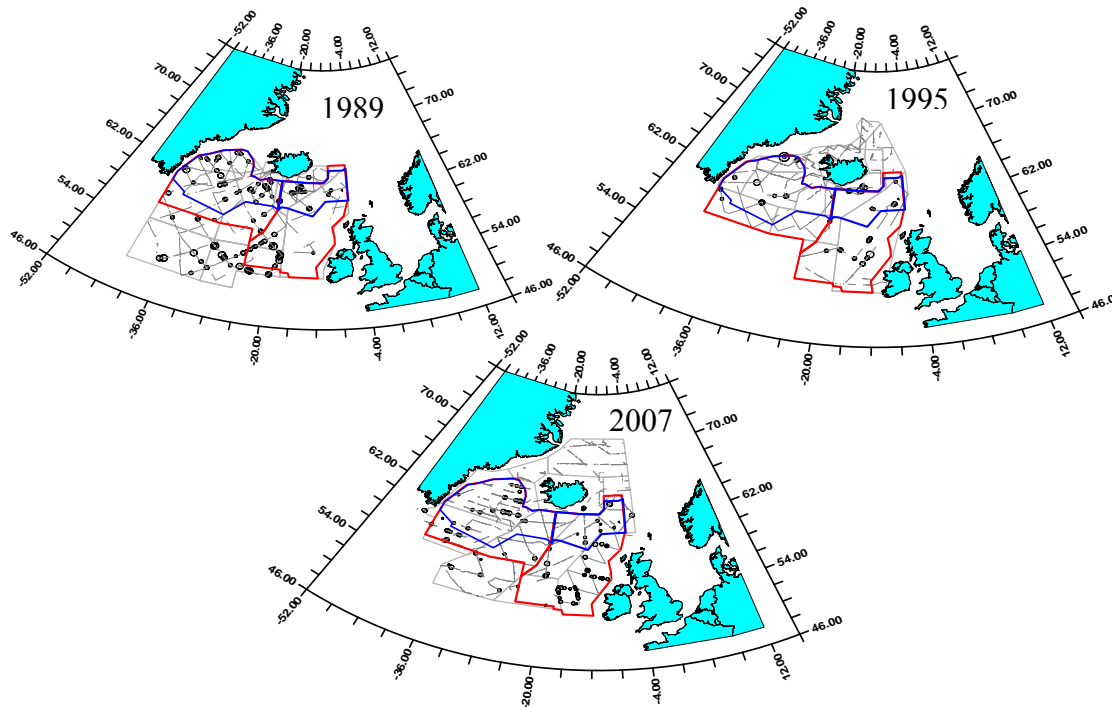
The SC again **noted** that there is not sufficient new information to answer this request at this time.

## **8.9 Pilot whale**

### 8.9.1 Update

#### Faroe Islands

The NASS-T-NASS surveys subsequent to the 1989 survey have indicated decreasing abundance of pilot whales. However, estimates of pilot whale abundance derived using conventional distance sampling (CDS) from the 5 NASS-T-NASS surveys are not directly comparable to one another because of different survey extents and, in the case of the 1989 NASS, different survey timing. Therefore, the NAMMCO SC-17 recommended 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. In 2011 NAMMCO SC-19 recommended to develop this index only using the three largest surveys and including the data from the CODA survey for enlarging the reference area.



**Figure 3.** Survey effort and sightings of pilot whales. Symbol size varies with group size from 1 to 500. For 2007 extension effort is shown in blue. Sightings outside of the survey area in 2007 were made by extension vessels. The Index Areas are outlined in blue (5 Survey) and red (3 Survey).

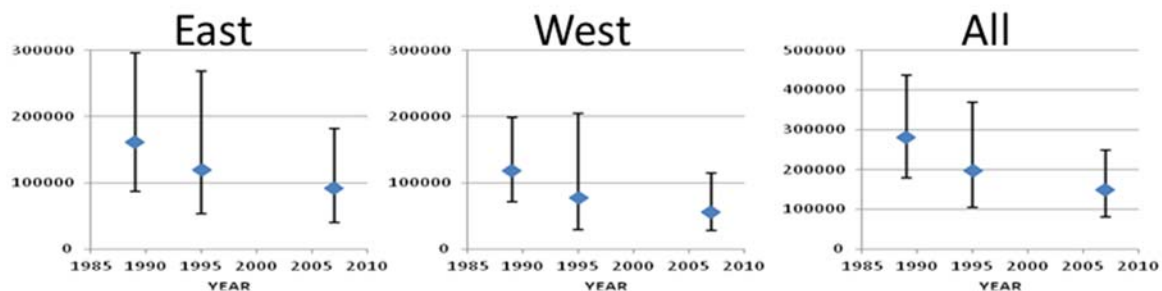
As an answer to these recommendations, Desportes reported NAMMCO SC/20/18. CDS was used to develop indices of relative abundance. The varying spatial coverage of the surveys is accommodated by delineating common areas (Fig. 3) that were covered by: i) all the surveys (red area), and ii) the 3 largest surveys (1989, 1995 and 2007, blue area). These “Index Areas” were divided into East and West sub-regions. Post-stratification was used to obtain abundance estimates for the index areas only. Estimates are provided using the sightings from the combined platforms or the primary platform only for surveys that used double platforms, and including and excluding extension vessel sightings in 2007.

Estimation of pilot whale group size had a strong influence on estimated abundance and varied significantly among the surveys. Mean group size was larger in 1987 than for the other years, especially for the Faroese vessel. It appears that the definition of a “group” and the estimation of its size have changed over the course of the surveys. Other potential biases include differences in survey timing and changes in the number of observers on the primary and combined platforms.

Abundance of individuals declined in both the 5 and 3 Survey Index Regions (Fig. 4), but the rate of decline was not significantly different from 0 in most cases. Sensitivity analyses indicate that annual rates of increase of -4% to -5% and -4% would have been detectable in the 5 and 3 survey analyses

respectively. The abundance of groups did not show a unidirectional trend over time. The index area comprises only a small portion of the summer range of the species and changes in distribution may have influenced the results.

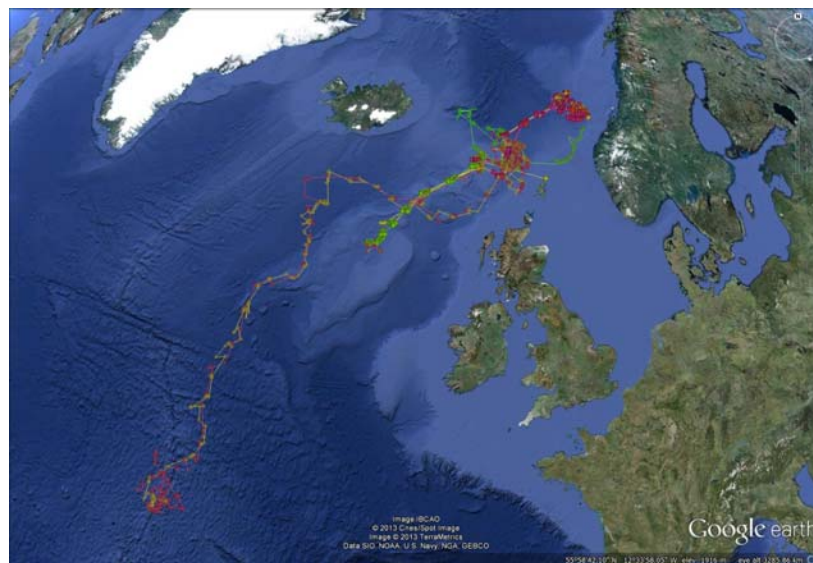
The results are suggestive of a decline in abundance over the past two decades, although no firm conclusions could be reached about the reality or causes of the apparent decline in the relative abundance of pilot whales in the index areas. The role of operational changes in the surveys is equivocal and 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.



**Figure 4.** Pilot whale abundance by 3 Survey Index Region (East, West, All) for the Primary platforms.

#### *Pilot whale tagging*

Mikkelsen informed about recent progress of pilot whale tagging in the Faroes (Fig. 5).



**Figure 5.** Tracking data from pilot whales tagged in the Faroe Islands.

In 2012 animals from one pod were fitted with satellite transmitters. The longest track was 125 days. This was the fourth successful tagging. During the first five days, the pod stayed at the islands. Then the group moved east, out to the deeper Faroe- Shetland Channel area. After one month, one tagged animal started moving east, toward the Norwegian coast. When reaching the shelf, it turned north, following the shelf slope, and was approaching the Frøya Bank, when contact was lost, after 49 days. After residing for two months in the Faroe- Shetland Channel, the main group started to migrate south. When reaching the Rosemary Bank, the pod swam westward, out into the deeper Iceland Basin. Thereafter the group moved south, to the Edoras Bank, and from there on in a south-west direction until

the pod reached the Mid-Atlantic Ridge. The pod was located on the Mid-Atlantic Ridge when tracking failed. At this stage the group was 1,300 nautical miles away from the tagging location, and the nearest land was the Azores, 350 nautical miles south. The effort to track pilot whale pods off the Faroes will continue.

The SC **noted** that these data are highly valuable and is pleased that tagging will continue.

### ***Iceland***

In the last 2 years, there have been 2 mass stranding events, while the last one previous to 2012 was in 1990.

#### **8.9.2 Future work**

A new assessment of pilot whales should consider the trend analysis but should await a new abundance estimate from the planned T-NASS 2015 sightings survey.

The Faroese part of T-NASS 2015 will target pilot whales, and it is recommended to use tracking data in the allocation of survey effort. It is also recommended investigate potential cooperation with SCANS-III, with the reservation that these surveys are not planned for the same year.

The satellite tracking programme is ongoing. There have been problems with longevity of the tags (longest track so far 133 days) and to get access to pods for tagging. It is **recommended** that more tracking data are collected, especially from offshore areas, with a focus on the period during sightings surveys (July-August). The SC also **recommended** that the trend data and tracking data should be taken into consideration by the T-NASS 2015 planning group.

### **8.10 Dolphins**

See Agenda Item 9.2 for discussion of acoustic detections of dolphins in the T-NASS 2007 Acoustic report.

In regards to **R-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 dolphins and that information on white-beaked dolphins should be available from Iceland and Norway in about 2 years. 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 SC noted that there is no new data available to answer this request.

#### **8.10.1 Future work**

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.

### **8.11 Harbour porpoise**

#### **8.11.1 Update**

##### **Harbour Porpoise Working Group**

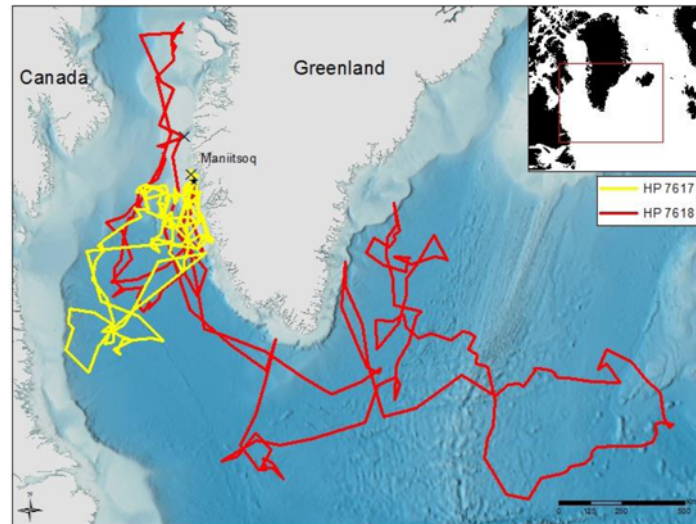
The NAMMCO Working Group on Harbour Porpoises met in Copenhagen 4-6 November 2013. In attendance were 12 scientists representing Greenland, Norway, Faroe Islands, Denmark, and Scotland, as well as the NAMMCO Secretariat. The SC has been requested to conduct a comprehensive assessment of the harbour porpoise throughout its range. This was the first meeting and terms 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**

### *Stock delineation*

Harbour porpoises off West Greenland were tracked in order to study distribution and site fidelity. Two animals, tracked for more than a year, spent on average 83 % (72% for the sub-adult and 94% for the adult) of their time in offshore areas (depths >200 m) and had maximum dives down to 382 m (the sub-adult) and 410 m (the adult). The two harbour porpoises displayed deep dive depths not previously documented, spent most of the year in offshore waters, and exhibited site fidelity to West Greenland (returned to tagging location).



**Figure 6.** Tracks of two harbour porpoise tagged in West Greenland

No new genetic data was available. Previous genetics studies have suggested that porpoises off West Greenland constitute a separate population from animals off Newfoundland, in the Gulf of Maine, and off Iceland. In agreement with the genetics studies, the tagged animals did not indicate any overlap with other stocks to the West, off Canada, and to the East, off Iceland. However, the winter range of these other stocks is unknown. The working group concluded that West Greenland should be considered a separate stock, and a separate management unit, based on current evidence.

### *Life history*

For assessment modelling, the following parameters were agreed upon by the working group: age at first reproduction 3-5 years, pregnancy rate 0.85 – 1 and calving interval 1/year (average), no senescence.

### *Abundance*

A aerial survey conducted in West Greenland in August-September 2007 estimated the at-surface abundance of harbour porpoises, corrected for perception bias, to be 10,314 (CV=0.35). Correcting for the proportion of porpoises expected to be outside the survey strata during the survey period (9 tracked porpoises spent 73 % (CV=0.13) of time inside the strata) the at-surface abundance estimate increased to 14,129 (CV=0.37) porpoises. By using satellite transmitter data on the time spent at the surface during daytime in August-September (average percentage of time spent at 0 m depth was 5.14% (CV=0.13)), to correct the at-surface abundance estimate for porpoises detected breaking the surface, a fully corrected abundance estimate provided 274,883 (CV=0.39, 95% CI 130,974-576,909) harbour porpoises in West Greenland in 2007.

The working group accepted the approach of correcting the abundance estimate for the percentage of time (27%) that the two tagged animals had spent outside the survey area. But the working group had considerable discussion of the correction factor used to account for animals not available at the surface. It was noted that the overall correction factor,  $g(0)$ , for animals missed on the transect line used to correct the Greenland survey estimate was  $0.57$  (perception bias)  $\times 0.0514$  (availability bias)  $= 0.0293$ , which was an order of magnitude less than estimates from other aerial surveys for porpoises. The working group agreed to consider two correction factors in an attempt to put bounds around the problem. One was the percentage of time spent at 0m (5.14%), mentioned above. The second was the percentage of time spent at 0-1m, that was calculated by interpolating between 0m and 0-2m based on data on the percentage of time at 0m, 0-1m and 0-2m provided from 14 porpoises instrumented with time-depth recorders in Danish waters (28%, CV= 0.13). The estimate of abundance by applying the 28% “at surface” correct factors resulted in a corrected estimate 50,461 (CV= 0.39).

### *Catches*

Most catches of harbour porpoises were taken in central West Greenland during summer months; the town of Maniitsoq and its adjacent settlements were responsible for 40% of all catches. There was a drop in catches in the 1970s which may have been due to the hunters being recruited into fisheries activities rather than hunting. There were large increases in catches in past 19 years, which may be due to multiple factors, including improvements in technology (introduction of motorized dinghies), increased harbour porpoise population, and the new reporting system.

A questionnaire survey among 28 hunters in Maniitsoq in 2013 found that data from 15 hunters in 2012 were not included in the *Piniarneq* statistics, and this non-inclusion corresponds to 45% of the porpoise catches obtained through the interviews. The correction factor for missing data on harbour porpoise catches in Maniitsoq equals 1.8. Despite the uncertainties it was recommended that this correction factor was applied to catch reports from *Piniarneq* (after 1993) in order to derive a realistic time series useful for assessment of harbour porpoises in Greenland. *Piniarneq* does not require reporting of struck and lost. However, the interview revealed a struck and lost rate of 8%.

In the assessment modelling, three options (low, medium, and high catches) were used for handling combined data from the different reporting schemes and their impacts on correction factors for underreporting. Data from 1980-1988 were excluded due to the unrealistically low and declining reported catches.

### *Population modelling*

An age- and sex-structured population models with exponential or density regulated growth, using the abundance estimate from 2007, the historical catches starting from 1975, and age-structure data from the hunt (corrected for hunting selectivity) in three periods, was designed. Results for six runs combining the two different availability corrections of the abundance estimate, with three different estimates of the historical catches were provided.

Dependent upon how the data from the high and the low abundance estimates were combined with the data from the low, medium, and high catch histories, the model estimated the dynamics of harbour porpoises in West Greenland quite differently. For the high abundance estimate, the population increased regardless of the catch history. For the low abundance, the population declined, even with the low catch history. For low abundance and the medium catch history, the population declines more rapidly. Hence, to obtain a consistent assessment model that is useful for providing management advice, it is essential that the uncertainties associated with the abundance and catch history estimates are resolved.

### *Management advice*

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.

### *Norway*

#### *By-catch*

General additive models (GAMs) were used to derive by-catch rates of harbour porpoise, from data collected during 2006–2008 from a monitored segment (18 vessels) of the Norwegian coastal fleet (vessels <15 m) of gillnetters targeting monkfish and cod (Björge *et al.* 2013). By-catch rates were then applied to fishery catch data on the target species to estimate the total number of porpoise taken as by-catch by two coastal gillnet fisheries. The two best models estimated by-catches of 20,719 and 20,989 porpoises during 2006–2008, with CVs 36% and 27%, respectively. Thus, about 6,900 harbour porpoises are taken annually in the coastal monkfish and cod gillnet fisheries. Although no abundance estimate is available for the coastal harbour porpoise population, the annual by-catch is likely not sustainable.

To reduce harbour porpoise by-catches, it was recommended that large mesh nets associated with the monkfish fishery to be prohibited at depths less than 50m. The group also recommended conducting experiments using Acoustic Deterrent Devices (ADDs or ‘pingers’) on nets set deeper than 50 m. If these devices prove successful in reducing porpoise by-catch, it was proposed that ADDs should be implemented in the Norwegian coastal gillnet fisheries for monkfish.

#### *Mitigation*

Two options were considered for mitigation: the use of pingers on nets as a porpoise deterrent, or changing the fishery by moving the fleet to waters deeper than 50 m. An experiment is currently running with pingers in Vestfjorden. If the pingers are effective as a deterrent at depths down to 400m, they will be recommended for use in the monkfish fishery. For the cod fishery, further consideration is needed due to the very high fishing effort in the cod spawning area. The group welcomes and encouraged efforts by Norway to investigate by-catch mitigation.

#### *Abundance estimation*

The last updated information on distribution and abundance of harbour porpoises in Norwegian waters is from 1995. In the last series of mosaic surveys (2008–2013), there were fewer sightings of harbour porpoises compared with earlier periods. There may be several reasons for these low numbers, bearing in mind that these surveys were designed for minke whales, and therefore detection probability for harbour porpoises is low. These surveys do not give a reliable abundance estimate for porpoises because they are designed to estimate minke whale abundance and therefore do not cover the coastal habitat of harbour porpoises, and they are run in conditions up to (but not including) Beaufort 5.

Distributional maps of incidental sightings show that the species is commonly observed in near coastal waters, archipelagos and fjord systems along the entire Norwegian coast. Although sightings have been made throughout the year, most of the observations are recorded during the season April–September (July being highest).

The working group strongly recommends that surveys to estimate abundance of harbour porpoise in Norwegian coastal archipelagos and fjord waters are carried out. These surveys may start in the areas of highest by-catch (Vestfjorden). Possible future techniques for surveys to improve detectability in the fjords could include using drones and acoustic monitoring. The group acknowledged that the SCANS-III survey, scheduled for 2016, will conduct a number of experimental surveys and will investigate survey techniques in 2015 and cooperation between coordinators of SCANS-III and T-NASS 2015 is recommended.



### *Stock delineation*

The most recent update of information on stock identity of harbour porpoises in Norwegian waters has indicated two subpopulations - Barents Sea and northern North Sea. No new information was available on movements of harbour porpoises in Norwegian waters, although the distribution from incidental sightings along the coast is continuous, which does not support separate populations. The working group recommends both tracking and genetic studies 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.

Zabavnikov reported that harbour porpoises have been observed in southern Barents Sea, including the Pechora sea (see NPR-R), and a vessel based survey gave uncorrected estimates of about 3000 animals. It is known that there is some by-catch in the southern Barents Sea, but the numbers are unknown at this time.

Taking into consideration the work of the HP WG, the SC **recommends** the following for 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.
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.

Taking into consideration the work of the HP WG, the SC **recommends** for 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).
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.

### **8.11.2 Future work**

Russia plans to collect data on harbour porpoise by-catch in the Kola Peninsula coastal zone. The next meeting of the HP WG is deferred until new abundance estimates are available.

## **8.12 Sperm whale**

### **8.12.1 Update**

The Acoustics Report from T-NASS 2007 has now been completed (SC/20/13): see Agenda Item 9.1.

### **8.12.2 Future Work**

No standing requests or plans for future research.

## **8.13 Bowhead whale**

### **8.13.1 Update**

#### *Norway*

Lydersen reported on 2 AURALs (Autonomous Underwater Recorder for Acoustic Listening) deployed in 2012-2013 (Framstredet and north of Svalbard) set to detect bowheads, narwhal and beluga. These were re-deployed in 2013 (for 2013-2014) in addition to 2 more (Kongsfjorden & Rijpfjorden). In

addition to the target species, the AURALS also detect blue and fin whales, bearded seals and a considerable amount of airgun noise from seismic exploration.

### ***Greenland***

Studies of whether females or males are vocalizing or singing are ongoing, with deployments of acoustic recorders on bowheads where skin biopsies are simultaneously obtained.

Aerial surveys were completed in West Greenland in 2012 and a comparison with a simultaneous genetic mark recapture study showed the genetics give higher abundance estimates. The reasons for the higher estimates are that the aerial surveys are snapshots of the situation, whereas genetics represent a whole influx of bowheads.

Heide-Jørgensen also noted a new paper on diving behaviour in bowheads (Heide-Jørgensen *et al.* 2013c).

### **8.13.2 Future work**

Acoustics studies both in Greenland and Svalbard are ongoing.

## **9. SURVEY PLANNING**

### **9.1 Acoustics Report**

The report from the acoustics data from T-NASS 2007 was presented. The report was prepared by Rene Swift at St Andrews and analysed the acoustics data from T-NASS 2007 collected on 4 vessels around Greenland, Iceland, and the Faroe Islands. The goal of the analysis was to look for clicks and if possible, identify to species. However, there were problems with deployment of equipment, and how the data were brought together. Therefore, NAMMCO contracted Rene Swift for further analysis to see if gathering click data was useful for including in T-NASS 2015.

Over 100 high frequency acoustic events were detected, from a total distance surveyed of almost 8,000 km. These were assigned to broad categories, *e.g.* delphinids. For medium frequency events, during a surveyed distance of over 18,000 km, 268 events were detected, and assigned to delphinids, 11 events to sperm whale, and a number of unidentified odontocetes.

This was the first broad scale acoustic survey in the North Atlantic. Combined with data from CODA, it represents the largest single dataset collected. The SC **referred** this report to T-NASS 2015 steering group.

In discussion it was noted that there were only 11 detections of sperm whales and these are unlikely to result in an accurate estimate to be of value in comparison to an estimate based on 100 sightings. However, it could be interesting to compare acoustic detections with sightings. There were a considerable number of dolphin detections, but further analysis would require additional funding.

It was noted that in the CODA survey, the abundance from acoustics was slightly higher than visual observations.

In relation to T-NASS 2015, it may be interesting to talk to the SCANS-III coordinators about adding some acoustics to their experimental surveys in 2015. These acoustics are not included in the NAMMCO T-NASS 2015 proposal but could be conducted during national survey activities.

### **9.2 Update - T-NASS 2015**

The NAMMCO T-NASS 2015 Steering Committee (Niels Øien, Geneviève Desportes, Thorvaldur Gunnlaugsson and Mads Peter Heide-Jørgensen, Chairman) met in Copenhagen on 10 December 2012 to prepare a joint proposal for a North Atlantic survey of selected cetaceans to be conducted in 2015 (T-NASS 2015).

### ***Background***

Due to national and international requirements, management decisions on cetacean harvests necessitate scientific advice based on updated abundance estimates. It is generally agreed within the NAMMCO SC that a better basis for the management of cetacean species in the area would be obtained through effort coordination aiming at a synoptic and contiguous survey across the whole North Atlantic. In particular it is important that the surveys are coordinated and designed to cover the target species, while at the same time allow for modifications necessary to meet national requirements.

The data gathered in such coordinated surveys could also be useful for detecting trends in distribution and abundance of species for ecosystem monitoring. This also requires a very large survey area and a series of surveys spread over time to be successful.

### ***Objectives of the proposal***

To obtain fully corrected abundance estimates for predefined target species and developed for all areas of importance for management.

The specific objectives for the planned T-NASS 2015 are:

To obtain unbiased abundance estimates of

- a) pilot whales around Faroe Islands useful for assessing the sustainability of the hunt
- b) minke whales in West Greenland, around Iceland, Jan Mayen and Svalbard and the central Norwegian sea
- c) fin whales southwest of Iceland.

### ***Approach***

1. The survey is focused on abundance estimates from areas and species that are important for providing robust abundance estimates useful for management
2. The following species are identified as primary target species: long-finned pilot whales, minke whales and fin whales. It is, however, assumed that the survey will also provide robust estimates of humpback whales, sei whales and to some extent also smaller cetaceans.
3. It should be attempted to include Canada and Russia and neighbouring countries in surveying parts of the Atlantic to extend the coverage
4. The survey should be planned for 2015 to ensure sufficient time for preparations and because other areas of the Atlantic likely will be covered by surveys conducted by the US and by the EU.

### ***Geographical coverage***

The geographical extent of the planned survey is shown in Fig. 7. In addition to areas covered in the past the following new areas were considered of primary importance for a T-NASS 2015 survey:

1. The East Greenland shelf from Kap Farvel to about 80°N where significant numbers of baleen whales have been detected by platforms of opportunity in recent years;
2. The area between Iceland and Jan Mayen is important for minke whales and could be the sink for minke whales not encountered in recent surveys in Iceland. It will not likely be included in the Norwegian mosaic surveys in 2015 and should be surveyed in T-NASS 2015 to ensure a coherent coverage with coastal Icelandic and East Greenland surveys;
3. Intensified survey coverage will be established around the Faroe Islands based on 'home range' information from ongoing satellite tracking experiments of pilot whales instrumented on the Faroe Islands.

Areas of secondary importance that would be important to include if options appear for including survey effort by neighbouring countries (*i.e.* Canada and Russia):

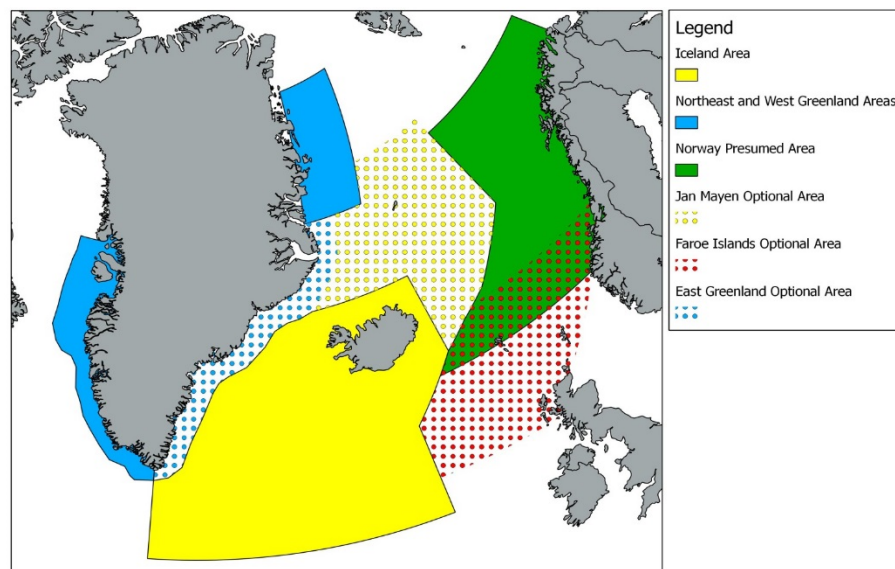
1. The offshore areas between the Labrador coast and the shelf areas of West Greenland that has not been surveyed in the past;
2. Areas south of the Irminger Sea and generally south of 55°N where sei whales and pilot whales occur;

3. Areas north of 70°N in West Greenland where recent catches of minke whales have been taken;
4. Areas between east Iceland and Norway depending on the Norwegian mosaic survey effort;
5. Areas in the northeast Barents Sea, Pechora Sea where Russian surveys have indicated increased presence of cetaceans.

Proper coverage of all areas of primary importance will ensure that unbiased estimates are obtained. The use of double-platforms will further reduce the bias of the estimates. Both approaches are critical for achieving a survey that will be of long-term value for the management of whales in this area. Coverage of areas of secondary importance will, depending on the applied survey methods, provide additional abundance estimates and data on distributional changes. Combined, such a large-scale survey will be able to detect major shifts in abundance caused by ongoing climatic perturbations in the North Atlantic. Finally the survey will provide critically important information on several non-target species and provide abundance estimates for some of those.

An example of how the results of this planned survey will be fundamental to the interpretation of observed changes in abundance is the minke whales around Iceland. A significant decline in abundance in coastal areas of Iceland was detected in the T-NASS-07 survey compared with previous surveys. However, critical areas north of Iceland and along the East Greenland coast were not included in the survey effort in T-NASS-07. It is therefore impossible to say if the decline represents a catastrophic drop in population abundance or if it constitutes a shift in occurrence, perhaps in response to oceanographic changes. In the survey planned for 2015 all areas will be covered and major shifts in abundance should be detectable.

The primary areas of focus for the 2015 survey extend about 1,740,000 nmi<sup>2</sup> (Fig. 7).



**Figure 7.** Extension of the proposed T-NASS 2015 and associated surveys. The estimated size of the areas is off Northeast Greenland 235,529 km<sup>2</sup>, Jan Mayen 726,044 km<sup>2</sup>, Iceland 2,860,193 km<sup>2</sup>, Norway 934,722 km<sup>2</sup>, Faroe Islands ~768,235 km<sup>2</sup>, East Greenland 233,659 km<sup>2</sup> and West Greenland 225,285 km<sup>2</sup>.

#### *Existing survey plans from member countries*

Individual NAMMCO member countries plan to conduct local surveys in 2015 and these are generally planned to be similar to those of the 2007 T-NASS survey. Survey expenses are listed in Table 4.

**Table 4.** Overview of survey expenses in millions NOK covered by National institutions for a T-NASS 2015

| Country       | Contribution  | Costs NOK         |
|---------------|---|-------------------|
| Greenland     | Survey platform (Twin Otter aircraft with survey crew)          | 1.5 mill          |
| Greenland     | Preparation, analysis and presentation in subsequent years      | 1.0 mill          |
| Iceland       | Survey platform (Two large survey vessel, aircraft and crew)    | 8 mill            |
| Iceland       | Preparation, analysis and presentation in subsequent years      | 2.0 mill          |
| Norway        | Survey platform (One large survey vessel for 6 weeks with crew) | 12 mill           |
| Norway        | Preparation, analysis and presentation in subsequent years      | 2.0 mill          |
| Faroe Islands | Survey platform (One large survey vessel for 4 weeks with crew) | 1.5 mill          |
| Faroe Islands | Preparation, analysis and presentation in subsequent years      | 1.0 mill          |
| <b>Total</b>  |   | <b>29 million</b> |

**Greenland** plans to conduct an aerial survey of West Greenland shelf area from Kap Farvel to Uummannaq in August-September 2015. No ship surveys are planned because of lack suitable survey ships and unfavourable weather conditions that require large effort during small windows of good survey conditions. Greenlandic scientists will ensure analysis and presentation of the survey results.

**Norway** conducts a series of mosaic surveys covering different part of the North Atlantic each year. According to the schedule of the mosaic surveys Norway will either cover the central Norwegian Sea or the area around Svalbard. Analysis and presentation of results are also covered by Norway.

**Faroe Islands** will provide a survey platform and has tentatively budgeted 1.5 million NOK for this. Participation by Faorese scientists is included in national budgets as well.

**Iceland** will provide 2-3 survey platforms that will cover the areas traditionally covered by Iceland (see Fig.1) and Icelandic scientists will participate in survey design, survey execution and analysis and presentation of results.

Aside from already planned national survey activities, there are also plans for surveys of cetaceans funded by oil companies in areas where oil exploration is planned (East Greenland approximately 2.5 million NOK) and there are also expected participations from Russia, Canada and other countries (estimated at ~6 million NOK).

For the target species chosen for T-NASS 2015 however, it is desirable to have larger, more coherent survey coverage. The expenses for a large scale survey cannot solely be covered by current national budgets and it is unlikely that funding for such an effort can be secured from scientific funding agencies. Thus the NAMMCO T-NASS 2015 Steering Committee seeks advice from the Council on possible avenues for ensuring proper funding of the survey.

### **Budget**

Based on experience from past surveys the Steering Committee has estimated the costs for a large scale survey to be in the magnitude of ~50million NOK, including Russian and Canadian contributions and national post-survey analysis and presentations of results. In comparison the total cost of the T-NASS-07 survey was 30 million NOK, when corrected for inflation to 2012. National funding contributions in terms of already planned survey effort, incl. ship-time, are expected to cover about 45 million NOK and additional 7 million NOK are needed to ensure coherent survey coverage in areas adjacent to areas surveyed by NAMMCO member countries.

Partial funding of the survey could cause gaps in coverage that will leave areas without data that cannot be included in the abundance estimates and will also reduce the options for detecting shift in abundance between areas. This scenario will eventually hamper the assessment of whale stocks.

**Table 5.** Overview of budget for the NAMMCO part of T-NASS 2015.

| Year                     | Notes below | Activities within NAMMCO                                | Costs NOK        |
|--------------------------|-------------|---|------------------|
| 2013                     |             | Meeting, development & co-ordination                    | 200,000          |
| 2014                     |             | Meeting, development & co-ordination                    | 200,000          |
| 2015                     |             | Meeting   | 20,000           |
| 2015                     | 1           | Contribution to increased coverage of pilot whale areas | 1,000,000        |
| 2015                     | 2           | Coverage of the Jan Mayen area                          | 5,000,000        |
| 2015                     | 3           | Coverage of East Greenland areas                        | 800,000          |
| 2016                     |             | Meetings and publication of results                     | 200,000          |
| <b>Total 2013 - 2016</b> |             |   | <b>7,420,000</b> |

1. The plan for the increased survey coverage of potential pilot whale habitat has two components:

- Design of survey strata based on information on habitat delineation of whales tracked by satellite; this will ensure that areas with the highest abundance are covered and that the survey can be intensified in this area;
- Independent estimation of group sizes based on aerial photographic counts of pilot whales in groups detected at sea by either the ship based survey platform, by satellite tracking or by the aerial platform; this will ensure that group sizes, that has been a notorious problem in past surveys, will be estimated precisely and independent of the survey that is then left with the task of counting groups in passing mode.

This survey design should enable robust estimation of pilot whale abundance from an area where the hunt is recruited and with low variance on the relevant abundance estimates;

2. The plan for the coverage of the Jan Mayen area is to conduct a ship-based survey with the methods used in the Norwegian mosaic survey design to ensure that this important area is covered simultaneously with Icelandic coastal areas and areas in the Norwegian Sea;
3. The East Greenland coastal area has not been covered in the past due to sea ice and the area is known to have conspicuous numbers of baleen whales. It will therefore be covered in T-NASS 2015 with an aerial survey conducted in the same way as the surveys in West Greenland in the same year.

#### ***Organisation of the T-NASS 2015***

The T-NASS 2015 will be organized by the Steering Committee appointed by the Council with members from the Scientific Committee. The Steering Committee will operate on their funding provided by the Council and this funding will be made available to national research agencies after an application procedure. For smaller amounts of funding for travels, meetings, preparation of proposals and purchase of equipment, a simple request for funding should be submitted to the Steering Committee. For the three large projects in 2015 it is required that each participant submits a detailed project description that can be reviewed internally and externally by the Steering Committee before the funding is provided. The applicants may be required to adjust the proposal based on proposals from the Steering Committee. The agreed project description thereafter also functions as a contract between the Steering Committee and the applicant.

#### ***Status for the development of the project***

The proposal for T-NASS 2015 was forwarded to the Finance and Administrative Committee in January 2013 and the Steering Committee was informed on a teleconference on 25 October that the FAC agreed

to ask the Steering Committee to move forward with the plans for the T-NASS 2015 as outlined in the proposal.

Shortly after that the members of the T-NASS 2015 Steering Committee were asked by the Chair to prepare the proposals for the surveys. Deadline for the proposals was 27 January 2014 with a subsequent meeting in Copenhagen on 3 February where the detailed proposals will be reviewed with the plan to forward them to the Council meeting in February 2014 for a final decision on funding.

In regards to the funding that was available in 2013 (but awaited decision on T-NASS 2015), the SC **recommends** that these funds are rolled over to 2014. These funds are necessary for planning meetings, the development costs of proposals, testing new technology, and the purchase of equipment that is already known will be needed. Further decisions regarding this will be made at the 3 February 2014 meeting in Copenhagen.

### **9.3 Other Updates**

No further updates.

### **9.4 Future Work**

The T-NASS 2015 Steering Group will meet 3 February 2014 in Copenhagen.

## **10. NAMMCO SCIENTIFIC PUBLICATIONS**

### **10.1 Online Publication**

Prewitt reported that online publication has been established in collaboration with the University of Tromsø's Septentrio Academic Publishing. In order to establish this cooperation with the UiT, it was necessary to formalize our ties with the UiT. To this end, NAMMCO established an Editorial Board consisting of one UiT professor (Lars Folkow), one SC member (Tore Haug), and the Scientific Secretary (Jill Prewitt). The Editorial Board, in conjunction with the NAMMCO Scientific Committee, will provide general oversight of the *NAMMCO Scientific Publications* series, including orderly progress of publication. Additionally, the Editorial Board may be asked to occasionally review manuscripts. Individual volumes will maintain scientific editors who are responsible for the content of those volumes.

The journal website (<http://septentrio.uit.no/index.php/NAMMCOSP/index>) published the first paper on 21 Aug 2013, and as of 12 November 2013, has had 640 visitors (although this is an artificially inflated number because it also includes visits to the site by Prewitt and the University site administrators) from 39 countries.

The current plan is to continue to print hard copies of the volumes, but in smaller numbers.

### **10.2 Volume 9: Walrus of the North Atlantic**

As of the SC meeting, 9 papers from the walrus volume have been published online, with another 5 in various stages of review. Although it would have been optimal to have this volume completed by the end of 2013, in all likelihood, it will be early 2014 before it is completed.

### **10.3 Volume 10: Age Estimation of Marine Mammals with a Focus on Monodontids**

As of the SC meeting, 2 papers have been published online. A few others are closer to publication, but it will likely be well into 2014 before this volume is completed.

The SC welcomes this development that has been long awaited, and compliments the new Scientific Secretary on this valuable contribution to the dissemination of the research results of the SC. Additionally, the SC encourages wider dissemination of information about the online publications, such as postings on MARMAM and other listservs. The SC should keep online publication in mind when looking at the future of the NSP series.

### **10.4 Other Matters**

## **11. DATABASES ON ABUNDANCE AND CATCHES**

### **11.1 Abundance**

The SC recommends that data that have been used to make distribution maps from NASS and T-NASS surveys be stored at the Secretariat. The SC recommends that the Secretariat liaise with Daniel Pike, who holds presently the set of data used to make maps for the Species Status project, and which is the most complete one.

This item should be revisited after completion of the stock status website.

### **11.2 Catches**

Catch statistics (including by-catch) from all countries for all species need validation before they can be included in assessments.

The SC has requested improved by-catch information, however there has apparently been little progress in by-catch reporting.

## **12. WORK PROCEDURES IN THE SCIENTIFIC COMMITTEE**

SC was pleased to see many audiovisual presentations at this meeting, and **reiterates** that participants are encouraged to make audiovisual presentations, for example of WG summaries.

The SC agreed to put future observer reports in the Appendices of the SC report.

Regarding payment of expenses for WG Chairs, in June 2012, document NAMMCO/FAC-June/2012/10 was presented to the FAC for its consideration, and contained the following memo directed to Council:

### **Memo on the payment of expenses for WG Chairs**

The Scientific Committee traditionally appoints working group chairs. It is important that the chair is competent and has the expertise relevant to the working group. For this reason, chairs are sometimes chosen from outside the SC in order to obtain the best person for the role. In such cases, NAMMCO supports the chairs by paying for expenses incurred in taking on the role (sometimes including salary). The **SC recommends that the Council** considers supporting travel and subsistence expenses for all nominated chairs of working groups, even from within the SC, in order to encourage individuals to take on the added responsibility, and ensure that the added expenses do not prevent competent scientists to accept the nomination.

Following enquiries from recent WG chairs, it is apparent that there was no decision regarding this recommendation. The SC therefore again submit this **recommendation** to Council.

## **13. FUTURE WORK PLANS**

### **13.1 Review of Active Requests**

The active requests were examined and reported under the relevant items.

### **13.2 Scientific Committee**

The 21<sup>st</sup> SC meeting is scheduled to be held in Norway. There was a suggestion for the location to be Longyearbyen, at the Svalbard Science Center. The date will likely be in late October/early November 2014.

### **13.3 Working groups**

The following working groups/meetings were proposed to be held before the next SC meeting:

- 1) **T-NASS Steering Committee:** First meeting 3 February 2014, Copenhagen.  
*Chair: Mads Peter Heide-Jørgensen*



2) **Beluga/Narwhal Catch Allocation Meeting:** 10-12 March 2014, Copenhagen.

The SC recommends that a small WG is held in 2013/14, before the next JWG meeting, to provide a framework for the catch allocation within the multi-stock model for Canadian and West Greenland narwhals. The Terms of Reference of this group should be:

- Review information on distribution, movements and harvest locations.
- Develop an allocation model that will provide a mechanism for assigning harvested animals to all summer stocks based on existing data.
- Specify and quantify exchange rates between aggregations and stocks.
- Identify and quantify uncertainty in the allocation model and determine implications for management.
- Recommend future work to resolve uncertainties within the model structure.

This group should ensure a useful catch allocation model given the current knowledge and data, and it would report back to the JWG at its next meeting. *Convenor: Mads Peter Heide-Jørgensen; NAMMCO Chair: Rod Hobbs.*

3) **Large Whale Assessment Working Group:** to be scheduled before the next SC meeting, Reykjavik.

As the present advice expires in 2015, the NAMMCO SC **agreed** to convene 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. *Convenor: Gísli Víkingsson; Chair: Lars Walløe.*

The following working groups/meetings were proposed to be held after the next SC meeting:

1) **Coastal Seals WG:** Late 2014/early 2015

The SC **recommended** that the Grey and Harbour Seals WG meet in late winter 2014 or early 2015 to finalise the **requests 2.4.2 and 2.5.2**. The WG meeting should assess the status of all populations, particularly using new abundance estimate data that are available from Iceland and Norway. The meeting should also address by-catch issues (grey seals) in Norway, Iceland, and the Faroe Islands, and a re-evaluation of the Norwegian management plans (which have been already implemented) for grey and harbour seals. It will also be advisable to include participation from at least Canada, UK, and the Baltic Sea countries. *Chair: Kjell Tormod Nilssen*

2) **A Ringed Seals WG** will be considered at the next SC meeting

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 the report from that meeting, and data availability, and consider a WG after the next SC meeting.

3) **Scientific symposium on disturbance effects on narwhals and belugas:** Early 2015.

The planning for this symposium will await Council's approval, and the outcome of the IWC meeting scheduled for March 2014 in Anchorage. If approved, the Steering Committee would be tasked with finding outside funding.

To address **R-3.4.9** (see below) the Scientific Committee recommends that an international symposium on the effects of seismic exploration and shipping activity on narwhals and belugas is being organized by NAMMCO in 2014. Among other things, the symposium should relate to the increasing pressure from the oil industry in Greenland, and it could include studies on

other species where information is missing on narwhals and belugas. Funding should be sought from industry and stakeholders.

The *Steering Committee* would include *Mads-Peter Heide-Jørgensen (NAMMCO SC)* and *Randall Reeves (Chair)*. Other relevant scientists for the Steering Committee include Malene Simon, Anders Mosbech, Susanna Blackwell, and Kate Stafford, but the final decision on members is left for Mads-Peter Heide-Jørgensen and the Chair to decide.

**R.3.4.9 NAMMCO/15-2005** (ongoing) - NAMMCO asked its Scientific Committee to 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. In 2009 (NAMMCO/18) it was further specified that there was no need for a broad assessment for all marine mammals, and that focus would be on walrus, narwhal and beluga.

The SC proposes that the Global Review of Monodontids meeting be held in conjunction with the 2016 biennial Holarctic Conference (see 13.4). Future planning will be dependent upon IWC input. The SC awaits further guidance from Council.

#### **13.4 Other matters**

There was discussion of SC/20/O02-IWC, a Global Review of Monodontids workshop/meeting. The idea is that this would be a joint NAMMCO-IWC meeting that will include a global review of all stocks of monodontids. This meeting would create the opportunity for experts working on monodontids to exchange information and technology with researchers from within and outside of NAMMCO countries. This global review will not replace the ongoing assessment work in the JCNB.

The SC **noted** that the Marine Mammals of the Holarctic biennial international conference could be alternate venue for exchange of scientific information on belugas with scientists, and this conference would be a useful meeting to have participation from a NAMMCO observer. SC was informed that the next meeting is in Sept 2014 in St. Petersburg, Russia. The SC noted that perhaps a global review of monodontids meeting should be held back to back with the following meeting (2016).

### **14. BUDGET**

#### **14.1 Spending in 2012/13**

The SC discussed the 2012/2013 budget.

#### **14.2 Budget for 2014 and T-NASS-15 budget up to 2016**

A draft SC budget for 2014 was discussed.

### **15. ANY OTHER BUSINESS**

#### **15.1 NAMMCO Stock Status List update**

The Secretariat is investigating an update to the [www.nammco.no](http://www.nammco.no) website and looking into how the stock status list can be incorporated into the website.

The original plan of the Stock Status List was to focus on the most prominent species in NAMMCO (*i.e.*, harvested species, especially large whales) and then continue with other species at a later date. As of now, the first phase has been completed, and the second phase will be completed this coming year. SC members will be asked to check the text and given a deadline, after which the information will be considered as having been validated. This matter should be discussed again at the next SC meeting.

#### **15.2 NPR Format**

The Secretariat thanked everyone for submitting NPRs, especially the observers.

During discussion it was also noted that electronic reporting has been implemented in ASCOBANS and the IWC. Kitakado informed the group that more time is needed to assess how this works, and progress will be reported at the next SC meeting.

It was proposed that an online reporting scheme for catch, by-catch, and strandings data could be developed in the future. An update to the NAMMCO website is currently being considered, and an update could possibly include a mechanism for reporting online.

In regards to the NPR format, it was agreed to delete the sections titled “Field Work,” “Laboratory Work,” “Other Studies” and “Research results” (b,c,d,e under Research) and leave “Research by species” for the given year. The section titled “Ongoing Research” will remain.

As for listing publications, it was noted that in the guidelines it requests report preparers to list peer-reviewed publications first and then “grey” literature separately.

## **16. MEETING CLOSURE**

### **16.1 Acceptance of report**

This report was approved in a preliminary form at end of the meeting and was accepted by correspondence on 9 December 2013.

### **16.2 Closing remarks**

The Chair thanked the Participants, the Observers and the Secretariat for an efficient meeting. The participants thanked the Chair for his able chairmanship.

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doi: <http://dx.doi.org/10.1080/17451000.2013.793812>

**ADOPTED AGENDA**

- 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
  - 4.2. Working Group Reports
  - 4.3. Other reports and documents
- 5. COOPERATION WITH OTHER ORGANISATIONS**
  - 5.1. IWC
  - 5.2. ASCOBANS
  - 5.3. ICES
  - 5.4. NAFO
  - 5.5. JCNB
  - 5.6. Other
- 6. ENVIRONMENTAL ISSUES**
  - 6.1. Sea-ice conditions
  - 6.2. Role of marine mammals in the ecosystem
  - 6.3. Other
- 7. SEALS AND WALRUS STOCKS - STATUS AND ADVICE TO THE COUNCIL**
  - 7.1. Harp Seal
    - 7.1.1. Update
      - 7.1.1.1. WGHARP
      - 7.1.1.2. Other updates
    - 7.1.2. Future work
  - 7.2. Hooded seal
    - 7.2.1. Update
      - 7.2.1.1. WGHARP
      - 7.2.1.2. Other updates
    - 7.2.2. Future work
  - 7.3. Ringed seal
    - 7.3.1. Update
    - 7.3.2. Future work
  - 7.4. Grey seal
    - 7.4.1. Update
    - 7.4.2. Future work
  - 7.5. Harbour seal
    - 7.5.1. Update
    - 7.5.2. Future work
  - 7.6. Bearded seal
    - 7.6.1. Update
    - 7.6.2. Future work
  - 7.7. Walrus
    - 7.7.1. Update – Report from the WG
    - 7.7.2. Other updates
    - 7.7.3. Future work
- 8. CETACEANS STOCKS - STATUS AND ADVICE TO THE COUNCIL**
  - 8.1. Fin whale

- 8.1.1. Update
- 8.1.2. Future work
- 8.2. Humpback whale
  - 8.2.1. Update
  - 8.2.2. Future work
- 8.3. Sei whale
  - 8.3.1. Update
  - 8.3.2. Future work
- 8.4. Minke whale
  - 8.4.1. Update
  - 8.4.2. Request from Council to review Iceland Minke Whale program
  - 8.4.3. Future work
- 8.5. Beluga
  - 8.5.1. Update
  - 8.5.2. Future work – planning JWG meeting; Global monodontid with IWC
- 8.6. Narwhal
  - 8.6.1. Updates
  - 8.6.2. Future work – planning JWG meeting; Global monodontid with IWC
- 8.7. Bottlenose whale
  - 8.7.1. Update
  - 8.7.2. Future work
- 8.8. Killer whale
  - 8.8.1. Update
  - 8.8.2. Future work
- 8.9. Pilot whale
  - 8.9.1. Update
  - 8.9.2. Future work
- 8.10. Dolphins
  - 8.10.1. Update
  - 8.10.2. Future work
- 8.11. Harbour porpoise
  - 8.11.1. Update – Report from the WG
  - 8.11.2. Other updates
  - 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

## **9. SURVEY PLANNING**

- 9.1. Acoustic Report
- 9.2. T-NASS 2015 Steering Committee
  - 9.2.1. Update
- 9.3. Other updates
- 9.4. Future work

## **10. NAMMCO SCIENTIFIC PUBLICATIONS**

- 10.1. Online Publication
- 10.2. Walrus volume
- 10.3. Monodontid age estimation volume
- 10.4. Other matters

**11. DATABASES ON ABUNDANCE AND CATCHES**

**11.1.** Abundance

**11.2.** Catches

**12. WORK PROCEDURES IN THE SC**

**13. FUTURE WORK PLANS**

**13.1.** Review of Active Requests

**13.2.** Scientific Committee

**13.3.** Working groups

**13.4.** Other matters

**14. BUDGET**

**14.1.** Spending in 2012/13

**14.2.** Budget for 2013/14

**15. ANY OTHER BUSINESS**

**15.1.** NAMMCO Stock Status List Update

**15.2.** NPR format

**16. MEETING CLOSURE**

**16.1.** Acceptance of report

**16.2.** Closing remarks.



**LIST OF DOCUMENTS**

| <b>Doc.No.</b> | <b>Title</b>  |
|----------------|---|
| SC/20/01       | Draft List of Participants  |
| SC/20/02       | Provisional Annotated Agenda  |
| SC/20/03       | Draft List of Documents   |
| SC/20/NPR-F    | National Progress Report – Faroe Islands  |
| SC/20/NPR-G    | National Progress Report – Greenland  |
| SC/20/NPR-I    | National Progress Report – Iceland  |
| SC/20/NPR-N    | National Progress Report – Norway   |
| SC/20/NPR-C    | National Progress Report – Canada   |
| SC/20/NPR-J-1  | National Progress Report – Japan – Large cetaceans  |
| SC/20/NPR-J-2  | National Progress Report – Japan – Small cetaceans  |
| SC/20/NPR-R    | National Progress Report – Russian Federation   |
| SC/20/04       | Observer's report on activities in ICES   |
| SC/20/05       | Report of the Working Group on Harp and Hooded Seals (WGHARP) – 26–30 August 2013, Murmansk, Russia   |
| SC/20/06       | Observer's report: 65 <sup>th</sup> meeting of the IWC Scientific Committee   |
| SC/20/07       | Observer's report: ASCOBANS AC20  |
| SC/20/08       | Report of the NAMMCO Working Group on Harbour Porpoises, Copenhagen, November 2013  |
| SC/20/09       | Report of the NAMMCO Working Group on Walrus, Copenhagen, November 2013   |
| SC/20/10       | Report of the expert workshop to review the Icelandic special permit research program (IWC report)  |
| SC/20/11       | Vikingsson <i>et al.</i> (2013) Response to the 'Report of the Expert Workshop to Review the Icelandic Research Program on minke whale                                  |
| SC/20/12       | IWC SC 65 Annex L 23 Update on beluga narwhal meeting   |
| SC/20/13       | T-NASS 2007 Final Acoustic Report   |
| SC/20/14       | NAMMCO Scientific Committee Expenses 2012/13 and Budget 2013/14 and beyond  |
| SC/20/15       | Annex 2 of Annual Report 2012: Summary of requests by NAMMCO Council to the Scientific Committee, and responses by the Scientific Committee                             |
| SC/20/16       | All Requests- Ongoing/Standing/New  |
| SC/20/17       | Revising National Progress Report Guidelines  |
| SC/20/18       | Pike <i>et al.</i> Estimates of the relative abundance and trend of pilot whales ( <i>Globicephala melas</i> ) from North Atlantic Sightings Surveys from 1987 to 2007. |
| SC/20/19       | Observer's report ASCOBANS MOP7   |
| SC/20/20       | Ugarte <i>et al.</i> Recent increase of catches of killer whales in Southeast Greenland - Is there a need for NAMMCO advice?  |
| SC/20/21       | WWG Summary   |
| SC/20/22       | HP WG Summary   |

**BACKGROUND DOCUMENTS**

| <b>Doc.No.</b> | <b>Title</b>   |
|----------------|--|
| SC/20/O/01     | NAMMCO SC19 Report   |
| SC/20/O/02     | IWC: Report of the Scientific Committee Annual Meeting 2013  |
| SC/20/O/03     | Grahl-Nielsen <i>et al.</i> (2011) Fatty acids in harp seal blubber do not necessarily reflect their diet. <i>Mar Ecol Prog Ser</i> 426:263–276 <a href="http://dx.doi.org/10.3354/meps09011">http://dx.doi.org/10.3354/meps09011</a>  |
| SC/20/O/04     | Lindstrøm <i>et al.</i> (2013) Harp seal foraging behaviour during summer around Svalbard in the northern Barents Sea: diet composition and the selection of prey. <i>Polar Biol.</i> 36:305–320 <a href="http://dx.doi.org/10.1007/s00300-012-1260-x">http://dx.doi.org/10.1007/s00300-012-1260-x</a> |

|            |   |
|------------|---|
| SC/20/O/05 | Øigård <i>et al.</i> (2013) From pup production to quotas: current status of harp seals in the Greenland Sea. <i>ICES J of Mar Sci.</i> <a href="http://dx.doi.org/10.1093/icesjms/fst155">http://dx.doi.org/10.1093/icesjms/fst155</a>   |
| SC/20/O/06 | Øigård <i>et al.</i> (2013) Functional relationship between harp seal body condition and available prey in the Barents Sea. <i>Mar Ecol Prog Ser.</i> 484: 287–301 <a href="http://dx.doi.org/10.3354/meps10272">http://dx.doi.org/10.3354/meps10272</a>  |
| SC/20/O/07 | Øigård <i>et al.</i> (2012) Modelling the abundance of grey seals ( <i>Halichoerus grypus</i> ) along the Norwegian coast. <i>ICES J of Mar Sci.</i> 69(8):1436–1447 <a href="http://dx.doi.org/10.1093/icesjms/fss103">http://dx.doi.org/10.1093/icesjms/fss103</a>  |
| SC/20/O/08 | Merkel <i>et al.</i> (2013) The World's Northernmost Harbour Seal Population– How Many Are There? <i>PLOS One.</i> (7): e67576. <a href="http://dx.doi.org/10.1371/journal.pone.0067576">http://dx.doi.org/10.1371/journal.pone.0067576</a>   |
| SC/20/O/09 | Footo <i>et al.</i> (2013) Tracking niche variation over millennial timescales in sympatric killer whale lineages. <i>Proc R Soc B.</i> 280: 20131481. <a href="http://dx.doi.org/10.1098/rspb.2013.1481">http://dx.doi.org/10.1098/rspb.2013.1481</a>  |
| SC/20/O/10 | Lydersen <i>et al.</i> (2013) A white humpback whale ( <i>Megaptera novaeangliae</i> ) in the Atlantic Ocean, Svalbard, Norway, August 2012. <i>Polar Res.</i> <a href="http://dx.doi.org/10.3402/polar.v32i0.19739">http://dx.doi.org/10.3402/polar.v32i0.19739</a>  |
| SC/20/O/11 | Bloch <i>et al.</i> (2012) Life History of Risso's Dolphin ( <i>Grampus griseus</i> ) (G. Cuvier, 1812) in the Faroe Islands. <i>Aquatic Mammals</i> 38(3): 250-266 <a href="http://dx.doi.org/10.1578/AM.38.3.2012.250">http://dx.doi.org/10.1578/AM.38.3.2012.250</a>   |
| SC/20/O/12 | T-NASS 2015 Proposal  |
| SC/20/O/13 | Nymo <i>et al.</i> 2013. Hooded seals   |
| SC/20/O/14 | Gísli A. Víkingsson, Bjarki Þór Elvarsson, Droplaug Ólafsdóttir, Jóhann Sigurjónsson, Valerie Chosson & Anton Galan (2014) Recent changes in the diet composition of common minke whales ( <i>Balaenoptera acutorostrata</i> ) in Icelandic waters. A consequence of climate change?, <i>Marine Biology Research</i> , 10:2, 138-152, DOI: 10.1080/17451000.2013.793812 |
| SC/20/O/15 | Manger (2013) Questioning the interpretations of behavioural observations of cetaceans; Is there really support for a special intellectual status for this mammalian order?   |
| SC/20/O/16 | Bjørge <i>et al.</i> (2013) Estimated bycatch of harbour porpoise ( <i>Phocoena phocoena</i> ) in two coastal gillnet fisheries in Norway, 2006–2008. Mitigation and implications for conservation  |
| SC/20/O/17 | Heide-Jørgensen <i>et al.</i> (2013) Winter and spring diving behavior of bowhead whales relative to prey   |
| SC/20/O/18 | Link to Marine Mammals of the Holarctic collection of papers  |

**NAMMCO SCIENTIFIC COMMITTEE WORKING GROUP  
ON HARBOUR PORPOISES  
4-6 November 2013, Copenhagen, Denmark**

**REPORT**

**1. CHAIRMAN'S WELCOME AND OPENING REMARKS**

Chair Mikkelsen (Faroe Islands) welcomed the participants (Address Section 5.6) to the meeting of the NAMMCO Working Group on Harbour Porpoises. He gave a brief introduction to NAMMCO, describing that Council will request information from the Scientific Committee (SC), and the SC will, when necessary, establish working groups to gather information around the requests. NAMMCO previously held a harbour porpoise working group in 1999, which gave rise to the NAMMCO Scientific Publications series Volume 5 published in 2003.

The current meeting was organized in response to the following request from NAMMCO Council: **R-3.10.1 - NAMMCO/7-1997**: to conduct a comprehensive assessment of the harbour porpoise throughout its range. In response to this request, the SC recommended (SC-19-15.3) that assessments of harbour porpoise be attempted for all areas by the working group, which would require at least two meetings. This meeting is the first meeting that will aim to provide a full assessment for West Greenland, and initiate the process for Norway, including a review of the method used for obtaining total by-catch estimates.

The outcome of this meeting will be a report with a list of recommendations.

**2. ADOPTION OF AGENDA**

The adopted revised agenda is given in Appendix 1.

**3. APPOINTMENT OF RAPPORTEURS**

Prewitt was appointed as rapporteur, with the help of other participants where needed.

**4. REVIEW OF AVAILABLE DOCUMENTS AND REPORTS**

Documents submitted for use in this meeting are listed in Appendix 2.

**5. GREENLAND ASSESSMENT**

**5.1 Stock delineation**

Nielsen presented the first data from satellite tracking of harbour porpoises (*Phocoena phocoena*) from West Greenland (SC/20/HP/08). Two female harbour porpoises (1 adult and 1 sub-adult) were driven into drift nets and equipped with satellite transmitters in July 2012, off West Greenland. The tags provided positions for +431 days (still transmitting) and 417 days, for the adult and sub-adult, respectively, and data on daily depths of dives ( $\pm 0.5$  m). After leaving the west coast of Greenland, the adult female made extensive movements north to the Disko Bay, south to East Greenland and south east into the central North Atlantic where it wintered (Fig. 1). It moved back to West Greenland the following summer. The other porpoise crossed the southern Davis Strait to Canada twice where it wintered in offshore waters before returning to the tagging site in West Greenland one year later. The porpoises travelled >17,500 km and 10,000 km (adult and sub-adult, respectively), spent on average 83 % (72% for the sub-adult and 94% for the adult) of their time in offshore areas (depths >200 m) and had maximum dives down to 382 m (the sub-adult) and 410 m (the adult). This is the first documentation of the annual movement cycle of an odontocete in the North Atlantic. The two harbour

porpoises in this study displayed site fidelity to the summer feeding ground and, despite different movement patterns, both demonstrated that they were capable of inhabiting oceanic parts of the North Atlantic for a major part of the year. This is in contrast to the perception that species is mainly coastal and suggests that the occurrence of the species in offshore areas has been overlooked likely because of their inconspicuous appearance and frequent sightings in coastal waters.

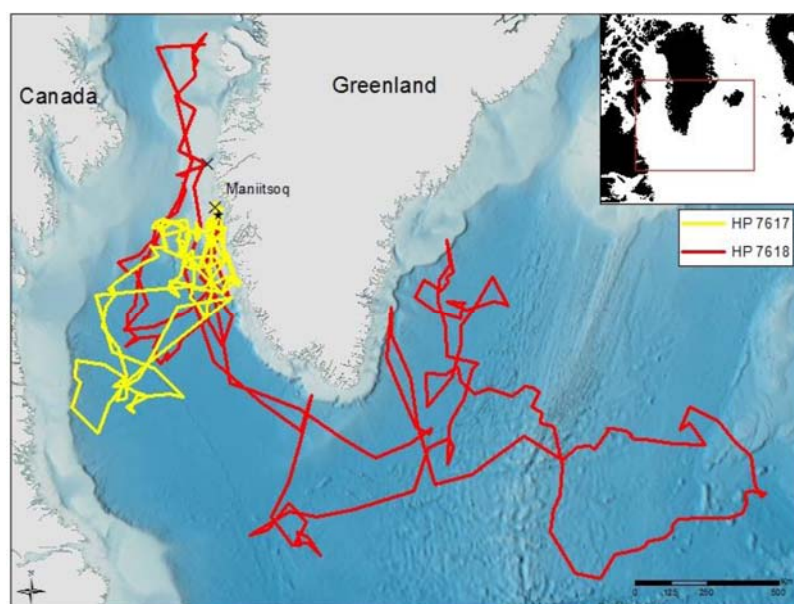
The working group welcomed this new study that provided interesting new information on movements of harbour porpoise in West Greenland, revealing extensive offshore movements that have not been documented in other areas. In addition, record dive depths to 410 m were logged. This new information was made possible by the high longevity of the tags, which lasted for more than one year.

The two animals described in this paper were tagged in July 2012. In addition, Nielsen and Heide-Jørgensen informed the group that additional animals were tagged in 2013, during two tagging periods: 7 were tagged in July and 8 were tagged in Sept/Oct 2013. Most of the 2013 animals were females, but 4 males were also tagged.

Caution is needed in interpretation of these data because they come from only 2 animals. Data from the animals tagged in 2013 (which include some males) will show if the movements and diving behaviour seen thus far are representative of harbour porpoises in West Greenland.

The group discussed factors that may influence this extensive offshore movement (Fig. 1). The animals could be feeding on small mesopelagic fishes and squids, but the working group would require more knowledge of fish and squid resources in the waters off Greenland, or in the Irminger Sea and in the Central North Atlantic to comment more on the possible interactions between harbour porpoises and these fisheries. There is a fishery in the Irminger Sea for redfish and a developing fishery for mackerel, which has the potential to include some by-catch of harbour porpoise. While the redfish fishery usually occurs in May-August outside of the depth range (600-700 m) of harbour porpoises (but see Sigurðsson, Þ. *et al.* 2006), the mackerel fishery may occur with more overlap (higher in the water column). Pierce reported that mackerel were present in harbour porpoise diets (1.5% of weight in stomachs from porpoises off Scotland). Some bias exists in these data because mackerel otoliths are fragile, but the proportion of the diet is still likely very small.

Questions were raised concerning whether there is an influence of ice cover and lack of daylight on the harbour porpoise movements. It is believed that most harbour porpoises move south outside sea ice range, thus avoiding ice entrapment. However, there is little information on the vertical migrations of potential prey items during winter in the Arctic. The dive depths of the 2 tagged animals suggest that the porpoises could feed at or near the bottom when they were near the coast, but not while offshore.



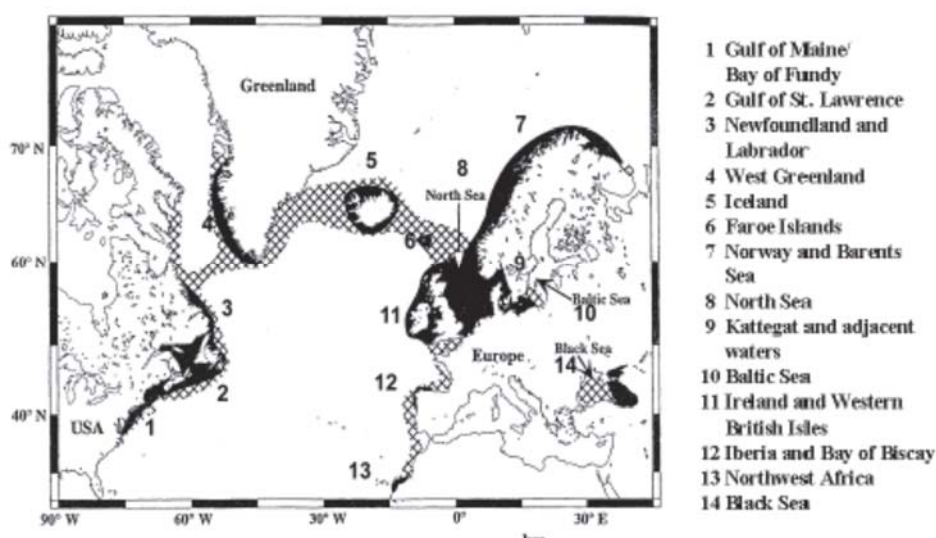
**Figure 1.** From SC/20/HP/08, Fig. 1. Movements of two harbour porpoises tracked by satellite. The star indicates where the porpoises were tagged on 25 July 2012 and the X's show the ends of the 2 tracks on 30 September 2013 after 431 and 417 days, respectively, with positions.

While they were in coastal areas, tracking showed that they did not use the fjords, which is contrary to behaviour seen in Norway.

The main conclusions of this study were that the harbour porpoises showed deep dive depths not previously documented, spent most of the year in offshore waters, and exhibited site fidelity to West Greenland (returned to tagging location within a couple of weeks of the tagging date the following year).

Previous genetics studies have suggested that porpoises off West Greenland constitute a separate population from animals off Newfoundland, in the Gulf of Maine, and off Iceland (Andersen 2003). With respect to stock delineation, the tagged animals demonstrated that they have the potential to move well offshore, beyond the previously described areas of distribution (Fig. 2). In agreement with the genetics studies, the tagged animals did not indicate any overlap with other stocks to the West, off Canada, and to the East, off Iceland. However, the winter range of these other stocks is unknown.

These genetic data were from 1995 and it was recommended that genetic studies should be updated with more recent samples (*e.g.* from the 2009 set of samples described in Heide-Jørgensen *et al.* 2011), and considered together with movements from tagging studies. Given the new data on offshore movements of porpoises from West Greenland, and increasingly favourable conditions for harbour porpoises in this area (Heide-Jørgensen *et al.* 2011), it is important to know if there is an influx of animals from other stocks that could contribute to the harvest.



**Figure 2.** Figure and caption from Andersen (2003) Fig. 1. Map showing the distribution of harbour porpoise populations/sub-populations and possible range in the North Atlantic (After IWC 1996 and Rosel *et al.* 1999). Populations and sub-populations and their possible range are indicated by solid black areas, while cross-hatched areas are the possible migration routes across the North Atlantic.

In conclusion, the working group **reiterated** that West Greenland should be considered a separate stock, and a separate management unit, based on current evidence.

## 5.2 Biological parameters

Heide-Jørgensen presented data on life history parameters from the catch of harbour porpoises with comparisons between three time periods (1988-1989, 1995, and 2009) (SC/20/HP/04). The data (Table 1) included age distribution (maximum age recorded was 17 years) and mean age at sexual maturity (as judged by presence of one or more corpora in females and combined testes weight exceeding 200g in males).

There were few animals above age 10 years, which is similar to the age distributions seen in other areas (North Sea and Danish waters). However, there were some differences in frequencies of younger animals caught, which may be due to hunter selection and seasonality (*e.g.*, the 1995 catches were earlier in the year).

**Table 1.** Mean age at sexual maturity with SE in parentheses.

|                                   | Females<br>1995<br>n=55 | Females<br>2009<br>n=60 | Males<br>1995<br>n=48 | Males<br>2009<br>n=29 |
|-----------------------------------|-------------------------|-------------------------|-----------------------|-----------------------|
| Mean age<br>at sexual<br>maturity | 3.7 (0.03)              | 3.5 (0.03)              | 2.7 (0.03)            | 3.1 (0.08)            |

The age structure of the animals obtained from the hunt is influenced by selectivity, and is not necessarily representative of the population. In particular, the youngest animals are underrepresented in catches.

Discussion focused on the biological parameters to use in assessment modelling. The following parameters were agreed upon:

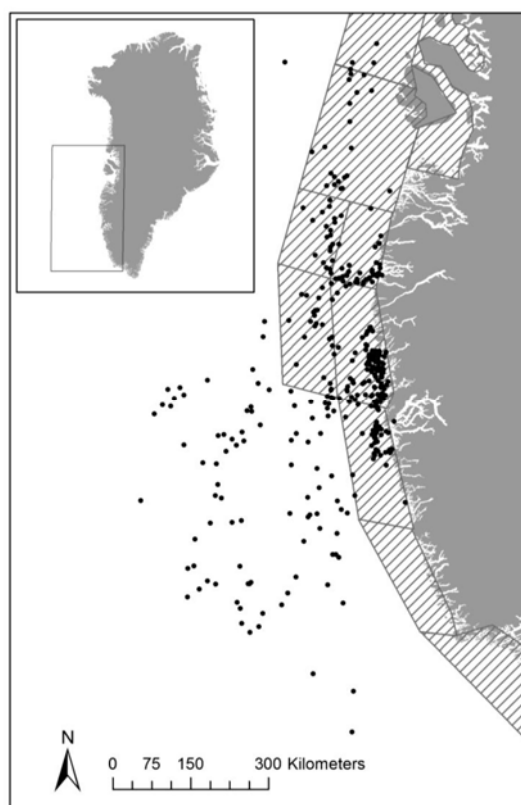
- Age at first reproduction: 3-5 years (see Table 1 above; figures are similar to those found in studies on porpoises from other areas)
- Pregnancy rate: 0.85 – 1 (unpublished data, Greenland Institute of Natural Resources; again consistent with some other studies, although higher than some estimates from strandings but the latter estimates tend to be downwardly biased due to poor health status of samples mature females)
- Calving interval: 1/year (average) and no evidence of senescence (Lockyer *et al.* 2001, 2003)

### 5.3 Abundance estimation

Heide-Jørgensen presented a new abundance estimate from West Greenland (SC/20/HP/07). A large-scale multispecies aerial survey conducted in August-September 2007 and was used to estimate the abundance of harbour porpoises in coastal areas of West Greenland (Hansen and Heide-Jørgensen 2013). The resultant estimate of the at-surface abundance of harbour porpoises inside the surveyed area corrected for perception bias was 10,314 (cv=0.35). Information from satellite tracking of 9 porpoises was used to estimate the proportion of porpoises that can be expected to be outside the survey strata during the survey period. The 9 porpoises spent a total of 73 % (cv=0.13) of their days in August-September 2012 and 2013 inside the strata covered by the aerial survey. Correcting for this increases the at-surface abundance estimate to 14,129 (cv=0.37) porpoises. Two porpoises tracked from July 2012 through October 2013 provided data on the time spent at the surface during daytime in August-September in both years. The average percentage of time spent at 0 m depth was 5.14% (cv=0.13). Correcting the at-surface abundance estimate for porpoises detected breaking the surface provided a fully corrected abundance estimate of 274,883 (cv=0.39, 95% CI 130,974-576,909) harbour porpoises in West Greenland 2007.

The working group accepted the approach of correcting the abundance estimate for the percentage of time (27%) that the two tagged animals had spent outside the survey area in August and September (Figure 3; SC/20/HP/07).

The working group had considerable discussion of the correction factor used in SC/20/HP/07 to account for animals not available at the surface. It was noted that the overall correction factor,  $g(0)$ , for animals missed on the transect line used to correct the Greenland survey estimate was  $0.57$  (perception bias; Hansen and Heide-Jørgensen 2013)  $\times 0.0514$  (availability bias) =  $0.0293$ , which was an order of magnitude less than estimates from other aerial surveys for porpoises; *e.g.* 0.14-0.37 in the SW Baltic Sea (Scheidat *et al.* 2008), 0.31-0.45 from SCANS-II (Hammond *et al.* 2013).



**Figure 3.** from SC/20/HP/07, Fig. 2. Distribution of daily positions of harbour porpoises relative to survey strata used for the aerial survey in West Greenland 2007.

Appropriate application of this correction factor requires consistency between the data used on (a) the criteria for detection of animals seen at the surface during the survey and (b) the tag data used to estimate the proportion of time that animals are at the surface.

#### **Animals seen at the surface**

Fewer than 20% of animals were recorded as being below the surface when detected on the survey (Table 2). All of these eight sub-surface sightings were made by the rear observer and all were duplicates of sightings made by the front observer. These sightings thus contributed to the correction for perception bias but not to the encounter rate and not, therefore, to the uncorrected abundance estimate in Hansen & Heide-Jørgensen (2013).

**Table 2.** Distribution of harbour porpoise detection cues on categories from the aerial survey in West Greenland in 2007 (Hansen and Heide-Jørgensen 2013).

| Cue both observers | n  | Percentage |
|--------------------|----|------------|
| Diving             | 13 | 31         |
| Surfacing          | 21 | 50         |
| Below surface      | 8  | 19         |
| Total              | 42 |            |

The working group discussed the extent to which animals could be detected below the surface on the survey. Heide-Jørgensen reported that it was difficult to see animals underwater in Greenlandic waters. The animals seen underwater by the rear observer could have been seen because the animals reacted to the aircraft. In surveys of Danish waters, 60% of detections were made at the surface (Heide-Jørgensen *et al.* 1993). However,



detection of animals underwater in Danish waters may be easier because they are sometimes seen against a light sandy seabed compared to always being seen against a dark surface off Greenland.

The working group also discussed whether all the sightings recorded as diving and surfacing (Table 2) would have been recorded as being at the surface from tag data because a tag is not above the surface throughout the period when an animal is visible on the surface. However, the relevance of this depends on how time at the surface is estimated from the tag data.

#### **Time at surface from tag data**

Heide-Jørgensen explained that the estimate of the proportion of time at the surface is derived from pressure transducer data (time at depth; 1s sampling rate) from the satellite-linked time-depth recorders, not from whether or not the tag is actually above the surface. To avoid problems with drift in the pressure transducer data, the 0m (surface) readings are calibrated from the conductivity sensor that instantly records when the tag breaks the surface. However, data on the length of time that the conductivity sensor is dry (tag is above the surface) are not recorded. In addition, depth data are recorded at a resolution of  $\pm 0.5\text{m}$ , so time at the surface is actually time when the transmitter is between 0m and 0.5m below the surface.

The working group noted that the time at depth data indicated a steep change in the proportion of time spent at 0m (surface) to 0-1m to 0-2m (Table 3). The correction factor used is therefore highly sensitive both to the extent to which animals can be seen below the surface and to the depth range used to calculate the correction factor.

**Table 3:** from SC/20/HP/11, Table 1. Proportion of time (%) spent at three depths for a porpoise from Denmark, and for two porpoises tracked by satellite in Greenland. \* indicates that the value was calculated based on the proportion of time in depth categories for the Danish harbour porpoise. CV indicated in parentheses. Proportions are cumulative.

| Depth | Denmark | Greenland   |
|-------|---------|-------------|
| 0 m   | 4.68    | 5.14 (0.13) |
| 0-1m  | 36      | 28 *        |
| 0-2 m | 54,6    | 42,4        |

Because of this, the working group agreed to consider two correction factors in an attempt to put bounds around the problem. One was the percentage of time spent at 0m (5.14%), as presented in SC/20/HP/07. The second was the percentage of time spent at 0-1m presented in SC/20/HP/11. These data were not available for the animals instrumented off West Greenland (only data for 0m and 0-2m were available) so this percentage was calculated by interpolating between 0m and 0-2m based on data on the percentage of time at 0m, 0-1m and 0-2m provided by Teilmann from 14 porpoises instrumented with time-depth recorders in Danish waters during daylight hours in summer. This correction factor was calculated as 28% with CV = 0.13 (Table 3).

#### **Estimates of abundance for use in assessment**

The working group agreed to correct the estimate of abundance presented by Hansen & Heide-Jørgensen (2013), by the two “at surface” correct factors, 5.14% and 28%, giving corrected estimates of 274,883 (CV=0.39), as presented in SC/20/HP/07, and 50,461 (CV = 0.39), respectively.

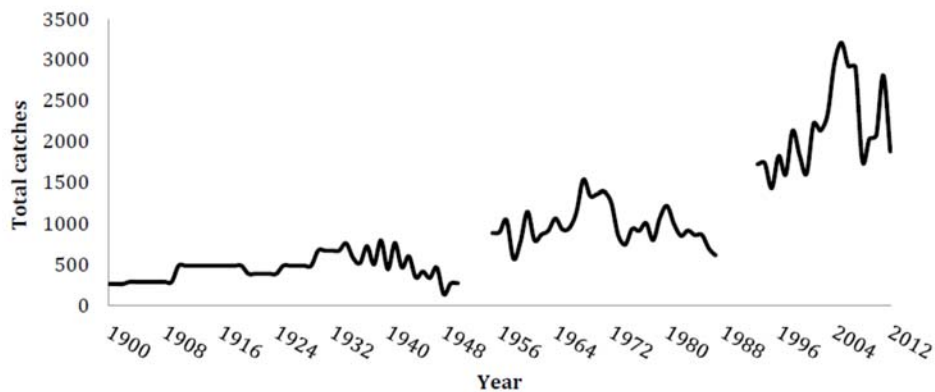
#### **5.4 Catch statistics**

Nielsen presented catch statistics for harbour porpoises in West Greenland (SC/20/HP/06). This paper summarizes available catch statistics for harbour porpoises (*Phocoena phocoena*) hunted in Greenland from 1900 to 2012. From 1900 – 1990 the catches were reported by year (Ministry of Greenland); however, catches in some years are missing from the time series. More complete reporting is available from 1993 – September 2012 (Piniarneq, Government of Greenland) when catches were reported by month. Most catches were taken in central West Greenland during summer months; the town of Maniitsoq and its adjacent settlements were responsible for 40% of all catches. To validate the reported catches in 2012 a questionnaire survey of 28 hunters was conducted in Maniitsoq, West Greenland, in 2013. From the interviews it was found that 113 (470-357) animals were not reported in 2012, however, the official catch statistics (Piniarneq) for October – December 2012 are not yet compiled (expected 2014). Adjusting the catches for the missing months revealed that the



catches reported in the interviews were in agreement with the expected catches for January – December 2012. The interview study furthermore revealed that the data from 15 hunters in 2012 of catches of harbour porpoises reported in Piniarneq were not included in the statistics, and this non-inclusion corresponds to 45% of the porpoise catches obtained through the interviews. Thus the correction factor for missing data on harbour porpoise catches in Maniitsoq equals 1.8. Despite the uncertainties it is recommended that this correction factor is applied to catch reports from Piniarneq (after 1993) in order to derive a realistic time series useful for assessment of harbour porpoises in Greenland.

SC/20/HP/06 showed increases in catches over three distinct catch periods, 1900-1950, 1955-1990, 1993-2012 (total uncorrected catches = 42,779; Fig. 4).



**Figure 4.** from Fig. 2 of SC/20/HP/06: The total annual catches of harbour porpoises in Greenland 1900 – 2012.

There was a drop in catches in the 1970s which may have been due to the hunters being recruited into fisheries activities rather than hunting.

There were large increases in catches in past 19 years, which may be due to multiple factors, including improvements in technology (introduction of motorized dinghies), increased harbour porpoise population, and the new reporting system. Comparisons of reports from the hunter questionnaire versus the official reporting (Piniarneq) showed that a correction factor for incomplete data must be applied.

Most catches occurred in the area around Maniitsoq and Sisimiut (Midwest Greenland). Although harbour porpoises were hunted year round, catches were mainly from August to October, but mainly July-October in Maniitsoq. Hunters do not specifically target harbour porpoises, but will take them when they encounter them, and are not required to report the location of the catch.

The issue of struck and lost was discussed. Piniarneq does not require reporting of struck and lost. Although not a part of the questionnaire, some hunters noted that they reported the number of porpoises they have seen die, but have not managed to retrieve. Hunters also reported that they do not lose very many animals because they usually float. However whether they float depends on which part of the body they are shot and possibly also depends on seasonal changes in blubber thickness. The struck and lost rate, as included in catch numbers reported in Piniarneq, is 8% (unpublished data, Greenland Institute of Natural Resources).

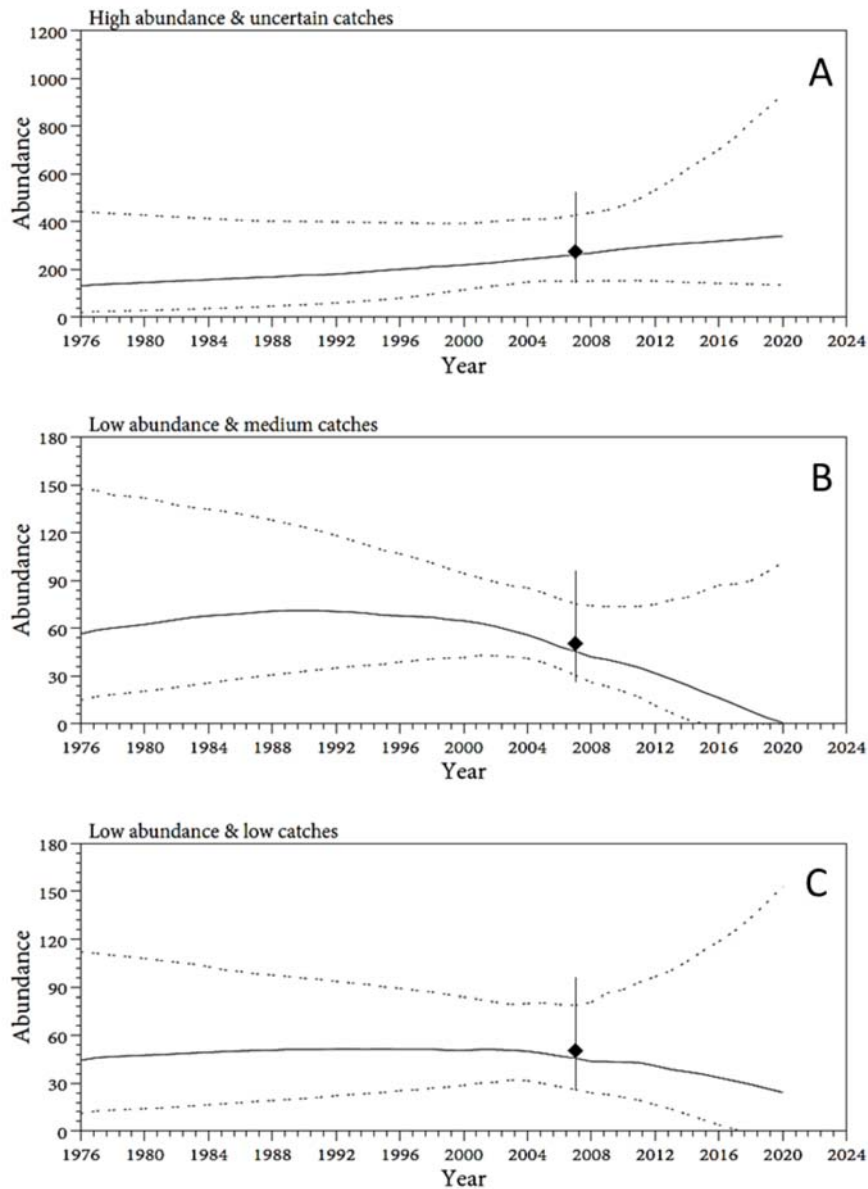
Catches have been reported since 1900. It has been obligatory to report harbour porpoise catches but there were differences in the reporting in later schemes. The catch reporting system is known to have deteriorated in 1980s - 1992, and this deterioration could have started from the late 1970s.

This may also explain the decrease in reported catches around the late 1970s. In the assessment modelling, data from 1980-1988 were excluded due to the unrealistically low and declining reported catches.

On the issue of including catch history data in the population modelling, the group agreed that there were three options (low, medium, and high catches) for handling combined data from the different reporting schemes and their impacts on correction factors for underreporting. These three options are detailed in the next section.

### 5.5 Population modelling

Witting presented SC/20/HP/05 which used the abundance estimate from 2007, the historical catches starting from 1975, and age-structure data from the hunt (corrected for hunting selectivity) in three periods, to build age- and sex-structured population models with exponential or density regulated growth. The paper provided results for six runs that combined the two different availability corrections of the abundance estimate, with three different estimates of the historical catches.



**Figure 5:** Population trajectories for three scenarios for West Greenland harbour porpoises based on density regulated growth models 'd' (SC/20/HP/05). The abundance axes are in units of 1000. Panel A shows the trajectory for the high abundance estimate and uncertain catches that span the range from the low to the high catch history. Panel B shows the trajectory for the low abundance estimate and the medium catch history, and Panel C shows the trajectory for the low abundance and the low catch history. The solid curves are the median trajectories, the dotted lines show the 95% credibility intervals, the diamonds are the 2007 abundance estimates with 95% confidence intervals. Catches after 2012 are set to catches in 2012.

A low catch history was derived using the reported catches from 1975 to 1980, together with the reported catches from 1993 to 2012, with the 2011 and 2012 catches corrected for animals not reported in Maniitsoq. The 1975 to 1980 and the 1993 to 2012 series were combined by inserting catches based on a linear increase

between a 1981 catch assumed to be equal to the average catch from 1976 to 1981, and a 1992 catch assumed to be equal to the average catch from 1993 to 1997. A high catch history was derived by applying a 1.8 multiplication factor to the reported catches from 1993 to 2012, and scaling all the catches from 1995 to 1980 by a factor obtained by assuming that the average catch from 1976 to 1980 is equal to the average catch from 1993 to 1997. All the catches from 1981 to 1992 were also set to this average. A medium catch history was derived using the reported catches from 1955 to 1980, together with estimated catches from 1993 to 2012, obtained by multiplying the reported catches by 1.8 to correct for unreported animals. Similar to the low catch history, the two series were combined by inserting catches based on a straight line.

Dependent upon how the data from the high and the low abundance estimates were combined with the data from the low, medium, and high catch histories, the model estimated the dynamics of harbour porpoises in West Greenland quite differently. This is illustrated in Fig. 5. Panel A shows that for the high abundance estimate, the population increases regardless of the catch history. Panel C indicates that for low abundance, the population declines, even with the low catch history. Panel B shows that for low abundance and the medium catch history, the population declines more rapidly. Hence, to obtain a consistent assessment model that is useful for providing management advice, it is essential that the uncertainties associated with the abundance and catch history estimates are resolved.

## 5.6 Management Advice

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 is 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 2125.6 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 TNASS2015 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.

## 6. NORWAY ASSESSMENT

### 6.1 By-catch

#### 6.1.1 Numbers

Bjørge presented information on his paper (SC/20/HP/O07) on by-catch in Norway.

From Bjørge *et al.* 2013: Using data collected during 2006–2008 from a monitored segment (18 vessels) of the Norwegian coastal fleet (vessels <15 m) of gillnetters targeting monkfish and cod, we used general additive models (GAMs) to derive by-catch rates of harbour porpoise. These by-catch rates were then applied to fishery catch data on the target species to estimate the total number of porpoise taken by two coastal gillnet fisheries. The two best models estimated by-catches of 20,719 and 20,989 porpoises during 2006–2008, with CVs 36% and 27%, respectively. Thus, about 6900 harbour porpoises are taken annually in the coastal monkfish and cod gillnet fisheries. Although no abundance estimate is available for the coastal harbour porpoise population, this annual by-catch is likely not sustainable according to the management objectives defined by ASCOBANS. In the cod gillnet fishery, harbour porpoise by-catch rates decreased rapidly with increasing depth to 50 m and then levelled off. In the monkfish gillnet fishery, by-catch rates decreased linearly with increasing depth throughout the depth range fished. To reduce harbour porpoise by-catches, we recommend that large mesh nets associated with the monkfish fishery to be prohibited at depths less than 50m. We also recommend to conduct experiments using Acoustic Deterrent Devices (ADDs or ‘pingers’) on nets set deeper than 50 m. If these devices prove successful in reducing porpoise by-catch, we propose that ADDs should be implemented in the Norwegian coastal gillnet fisheries for monkfish.

Bjørge informed the working group that the lumpfish fishery will be monitored next. Fishermen reported that the porpoise by-catch rate may be relatively high. This is a small fishery, with a short season (the target is roe)

in winter. The working group considered the importance of including estimates of by-catch from this fishery in the assessment models (that is, whether the by-catch is sufficiently large to make a significant difference). The working group **recommended** that Norway compile as much information as possible about by-catch from other fisheries, and to look into the lumpfish fishery by-catch next.

Bjørge *et al.* (2013) reported high by-catch in shallower waters, but also by-catch in deeper waters (down to 400 m). Fishermen have the opinion that the porpoises are diving deep, and that they are not caught when the net is being deployed or hauled. Effort and depth appear related, so it may be difficult to separate these effects.

A higher coastal by-catch is reported in the monkfish fishery versus the cod fishery. Teilmann pointed out that video camera studies in Danish waters showed that 18% of unreported by-catch were due to the porpoises falling out of the net (Kindt-Larsen *et al.* 2012) before they are brought on board. Thus the cod fishery by-catch rate for Norwegian waters presented here could be underestimated. Cameras could possibly be used in the future to monitor Norwegian fisheries to see if harbour porpoises are falling out of the nets. It is likely that the rate of porpoises falling out of the net is lower in the monkfish fishery due to the larger mesh size.

The group **recommended** that samples be collected from by-catch in Norway, to obtain data on sex ratio, reproductive status, age structure, diet, contaminants, *etc.* It would be challenging to gather carcasses for the whole coast; the group therefore suggested that efforts are focused on the Vestfjord area where most of the by-catch occurs.

It would be informative to have tracking data from porpoises in Norway because the high by-catch in one area (Vestfjorden) could have a large impact on a local population. Harbour porpoises have been tagged in Danish waters, but those animals did not cross the Norwegian trench and did not move into coastal Norwegian waters. These animals do not appear to be part of the population that are subject to by-catch in Norwegian waters.

The working group **recommended** tagging of harbour porpoises in Norway to obtain information about behaviour for use in assessment. Movement data will be important also in light of changing environmental conditions (*e.g.*, food availability).

#### **6.1.2 Mitigation**

Bjørge informed the group that he is currently running an experiment with pingers in Vestfjorden. If the pingers are effective as a deterrent at depths down to 400m, they will be recommended for use in the monkfish fishery. For the cod fishery, this needs further consideration due to the very high fishing effort in the cod spawning area.

Two options are being considered for mitigation: the use of pingers on nets as a porpoise deterrent, or changing the fishery by moving the fleet to waters deeper than 50 m.

The group welcomes and encouraged efforts by Norway to investigate by-catch mitigation.

#### **6.2 Abundance Estimation**

Øien referred to Bjørge and Øien (1995) as the last updated information on distribution and abundance of harbour porpoises in Norwegian waters.

Øien presented harbour porpoise distributions from recent sighting surveys carried out by Norway (SC/20/HP/10). Shipboard sightings surveys with minke whales as the target species have been conducted in Norwegian and adjacent waters during the summer seasons around July in each of the years 1988, 1989 and 1995. With the survey methodology and procedures established in 1995 (Øien 1995), a series of six-year mosaic surveys was initiated in 1996. The purpose has been to cover the northeast Atlantic over a six-year time frame by surveying about 1/6 of the total area with two vessels annually.

The surveys have experienced methodological developments throughout the years with the specific aim to get a best estimate of minke whale abundance. Other cetacean species have nevertheless also been recorded during these surveys. However, given the focus on minke whales and associated tracking procedures, the collection of data for these other species may have been less than optimal. It is also important to note that the mosaic

surveys have been partial in annual coverage which also brings into question additional variance due to possible changes in distributions over the years.

Thus the 1995 survey stands out as the only large-scale synoptic survey which together with the Icelandic and Faroese surveys that year covered a major part of the Northeast Atlantic during NASS-95.

The surveys have been conducted with an intended searching speed of 10 knots. Acceptable conditions for primary searching have been defined as a meteorological sightability of greater than 1 km and sea states of Beaufort 4 or less. Detection probability for harbour porpoises typically decreases markedly in sea states above Beaufort 2. The surveys have been conducted in “passing mode”, such that the vessel did not break the track to approach the sighting, which is a factor which makes validation of species identification and group size more difficult. All vessels were equipped with two platforms usually placed one above the other and operating independently. The distribution plots in SC/20/HP/10 are based on primary sightings made from the primary platform, which is always the upper platform (usually a barrel) on all vessels.

During the period 2008-2013, the last in the series of mosaic surveys, there were fewer sightings of harbour porpoises compared with earlier periods. There may be several reasons for these low numbers, bearing in mind that these surveys were designed for minke whales, and therefore detection probability for harbour porpoises is low.

These surveys do not give a reliable abundance estimate for porpoises because they are designed to estimate minke whale abundance and therefore do not cover the coastal habitat of harbour porpoises, and they are run in conditions up to (but not including) Beaufort 5.

Øien presented SC/20/HP/09 where distributional maps of incidental sightings of harbour porpoises in Norwegian waters were shown. The species is commonly observed in near coastal waters, archipelagos and fjord systems along the entire Norwegian coast. Although sightings have been made throughout the year, most of the observations are recorded during the season April-September (July being highest). The data presented here do not support a change in distribution over the years.

There is a database of sightings from fishing vessels and research vessels which are not focused on marine mammals, but these show the same pattern of distribution as sightings surveys. For reasons that cannot be explained, sightings were higher in the period from 1996-2008 although the distribution was not changing. It appears that the animals are furthest North and offshore in late summer/fall, and follow the continental ridge towards Svalbard.

In order to estimate abundance of harbour porpoises, sightings surveys should include the coastal archipelagos and fjords.

Øien also presented SC/20/HP/12 which shows two years of tagging (total of 4 animals) in Varangerfjord. The animals were caught in traps set for salmon, and tags were deployed in May/June, and lasted 2-5 months. The movements were local, but deployment times considerably less than an annual cycle restrict the ability to make a determination on larger movements.

### **6.2.1 Survey Design**

In the fjords, harbour porpoises appear to be close to the shore, therefore a possible design could be a ship-based strip transect survey near the shore, and then a line transect survey in the middle of the fjord. Possible future techniques for surveys to improve detectability in the fjords could include using drones and acoustic monitoring.

The group did not elaborate further on the survey methods and technology, and this will be addressed in the future survey planning (see Thomas *et al.* 2007 and Bjørge *et al.* 2000).

The working group notes the large estimated by-catch of harbour porpoises in two coastal fisheries in Norway. To assess the effects on the population it is important to have estimates of abundance in the areas impacted by the by-catch. The working group therefore **strongly recommends** that surveys to estimate abundance in Norwegian coastal archipelagos and fjord waters are carried out. These surveys may start in the areas of highest by-catch (Vestfjorden).

The group acknowledged that the SCANS-III survey, scheduled for 2016, will conduct a number of experimental surveys and will investigate survey techniques in 2015, and cooperation between coordinators of SCANS-III and TNASS2015 is recommended.

### 6.3 Stock delineation

The most recent update of information on stock identity of harbour porpoises in Norwegian waters (Andersen 2003) indicated two subpopulations- Barents Sea and northern North Sea.

No new information was available on movements of harbour porpoises in Norwegian waters, although the distribution from incidental sightings along the coast is continuous, which does not support separate populations.

The working group **recommends** both tracking and genetics studies 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.

## 7. OTHER BUSINESS

Desportes, as coordinator of the Plan, presented the ASCOBANS Conservation Plan (ASCOBANS 2012) for the Harbour Porpoise in the North Sea. The Conservation Plan, adopted in 2009 and covering ICES areas IIIaN, IVabc and VIIed, aims at restoring and/or maintaining North Sea harbour porpoises at a favourable conservation status. The shorter-term pragmatic minimum objective is to at least maintain the present situation and, if possible, improve it. The Plan identifies by-catch as the main threat and is articulated around 12 specific management and /or research actions. Three actions are particularly relevant to the NAMMCO working group on harbour porpoises – by-catch estimation (A3 and A4), population abundance (A7) and population structure (A8) – as there is overlap between the area covered by the Plan and the area relevant to the assessment of harbour porpoises in Norwegian waters. Although, there has been progress in the implementation of the plan, none of the actions are fully implemented yet. The implementation status for the three actions most relevant to the working group was presented. Regarding the regular evaluation of by-catches in all fisheries, methods have been successfully developed for assessing by-catch in the less-than-15m fleet (reference fleet and remote electronic monitoring), but have not been widely implemented.

Following EU regulations, monitoring has been implemented in the trawl fishery in the North Sea, revealing no by-catch. However, the gillnet fisheries, which represent the highest risk to harbour porpoise, have been little monitored except in Norway and France, as this was not mandatory under EU regulation. In particular, there are no data since 2001 for the Danish gillnet fleet which had very high by-catch rate in the 80-90s and limited data for the UK gillnet fleet, which in 2009 represented 32% and 17% (respectively) of the reported gillnetter effort (days at sea) in the North Sea. Regarding stock structure, although signals from different lines of evidence, genetics, tagging and ecological tracers, point towards a sub-structuring in the North Sea, no clear divisions have been identified. New abundance data are patchy in space and time and therefore difficult to interpret at the population level. Therefore, the conservation status of the harbour porpoise in the North Sea remains unclear, with very patchy information on by-catch rates and trends in abundance. Efforts are continuing in North Sea states with assessing by-catch in the < 15m fleet, developing alternative mitigation methods - both pingers and modified and alternative fishing gears, looking at habituation and exclusion, and developing frameworks for determining safe by-catch limits.

## 8. RECOMMENDATIONS

### Greenland

- Given the recent discovery of large uncertainty in catches, the working group **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.
- The working group noted that TNASS2015 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

- The working group **recommended** that Norway compile enough information as possible about by-catch from other fisheries, and to look into the lumpfish fishery by-catch next.
- The group **recommended** that samples be collected from by-catch in Norway, to obtain data on sex ratio, reproductive status, age structure, diet, contaminants, *etc.* It would be challenging to gather carcasses for the whole coast; the group therefore suggested that efforts are focused on the Vestfjord area where most of the by-catch occurs.
- The working group **recommended** tagging of harbour porpoises in Norway to obtain information about behaviour for use in assessment. Movement data will be important also in light of changing environmental conditions (*e.g.*, food availability).
- The working group therefore **strongly recommends** that surveys to estimate abundance in Norwegian coastal and fjord waters are carried out. These surveys may start in the areas of highest by-catch (Vestfjorden).
- The working group **recommends** both tracking and genetics studies 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.

#### General recommendations for all areas

- The group noted that the SCANS-III survey, scheduled for 2016, will conduct an experimental survey to investigate survey techniques in 2015, and cooperation between coordinators of SCANS-III and TNASS2015 is **recommended**.

## 9. CLOSING REMARKS AND ADOPTION OF REPORT

Given that new information in response to the recommendations of the group will likely not be available until after 2015, a new harbour porpoise assessment meeting to discuss Greenlandic and Norwegian waters will not take place until after this time.

The report was adopted in a preliminary form at the end of the meeting. The final report was adopted by correspondence on 12 November 2013.

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### Agenda

1. CHAIRMAN WELCOME AND OPENING REMARKS
2. ADOPTION OF AGENDA
3. APPOINTMENT OF RAPPORTEURS
4. REVIEW OF AVAILABLE DOCUMENTS AND REPORTS
5. Greenland assessment
  - 5.1. Stock delineation
  - 5.2. Biological parameters
  - 5.3. Abundance estimation
  - 5.4. Catch statistics
  - 5.5. Population modelling
  - 5.6. Management advice
6. Norway assessment
  - 6.1. By-catch
    - 6.1.1. By-catch numbers
    - 6.1.2. Mitigation
  - 6.2. Abundance estimation
    - 6.2.1. Survey Design
  - 6.3 Stock delineation
7. OTHER BUSINESS
8. FINALIZE REPORT

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#### TERMS OF REFERENCE

**R-3.10.1 - NAMMCO/7-1997:** to conduct a comprehensive assessment of the harbour porpoise throughout its range.

## Document List

| Document Number | Title  |
|-----------------|--|
| SC/20/HP/00     | Practical arrangements   |
| SC/20/HP/01     | List of Participants   |
| SC/20/HP/02     | Draft Agenda   |
| SC/20/HP/03     | List of Documents  |
| SC/20/HP/04     | Heide-Jørgensen <i>et al.</i> Life history parameters from the catch of harbour porpoises in West Greenland.                       |
| SC/20/HP/05     | Witting <i>et al.</i> Assessment runs for harbour porpoise in West Greenland   |
| SC/20/HP/06     | Nielsen and Heide-Jørgensen. Catch statistics for harbour porpoises in West Greenland including correction for unreported catches. |
| SC/20/HP/07     | Heide-Jørgensen <i>et al.</i> Revised abundance estimate of 226 harbour porpoise in West Greenland.                                |
| SC/20/HP/08     | Nielsen <i>et al.</i> Extensive offshore movements of harbour porpoises ( <i>Phocoena phocoena</i> )                               |
| SC/20/HP/09     | Øien N, Hartvedt S. Incidental sightings of harbour porpoises in Norwegian waters.   |
| SC/20/HP/10     | Øien N. Offshore distributions of harbour porpoises in the northeast Atlantic from Norwegian sightings surveys 1988-2013           |
| SC/20/HP/11     | Heide-Jørgensen. Correction of at-surface abundance of harbour porpoises in West Greenland based on detection to 1 m depth.        |
| SC/20/HP/12     | Øien N. Harbour porpoise tracks North Norway   |

## Background Documents

|              |  |
|--------------|--|
| SC/20/HP/O01 | Santos MB, Pierce GJ, Learmonth JA, Reid RJ, Ross HM, Patterson IAP, Reid DJ, Beare D (2004) Variability in the diet of 226 harbour porpoises ( <i>Phocoena phocoena</i> ) in Scottish waters 1992-2003. <i>Marine Mammal Science</i> . 20(1):1–27   |
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| SC/20/HP/O03 | Pierce GJ, Santos MB, Cerviño S (2007) Assessing sources of variation underlying estimates of cetacean diet composition: a simulation study on analysis of harbour porpoise diet in Scottish (UK) waters. <i>J. Mar. Biol. Ass. U.K.</i> 87:213–221  |
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| SC/20/HP/O05 | Orphanides and Palka (2013) Analysis of harbor porpoise gillnet bycatch, compliance, and enforcement trends in the US northwestern Atlantic, January 1999 to May 2010. <i>Endangered Species Research</i> . 20: 251–269. doi: <a href="http://dx.doi.org/10.3354/esr00499">http://dx.doi.org/10.3354/esr00499</a>  |
| SC/20/HP/O06 | Larsen <i>et al.</i> (2013) Determining optimal pinger spacing for harbour porpoise bycatch mitigation. <i>Endangered Species Research</i> . 20: 147–152. doi: <a href="http://dx.doi.org/10.3354/esr00494">http://dx.doi.org/10.3354/esr00494</a>   |
| SC/20/HP/O07 | Bjørge <i>et al.</i> (2013) Estimated bycatch of harbour porpoise ( <i>Phocoena phocoena</i> ) in two coastal gillnet fisheries in Norway, 2006–2008. Mitigation and implications for conservation. <i>Biological Conservation</i> . 161: 164–173. <a href="http://dx.doi.org/10.1016/j.biocon.2013.03.009">http://dx.doi.org/10.1016/j.biocon.2013.03.009</a> |

|              |  |
|--------------|--|
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| SC/20/HP/O09 | Desportes G. Interim report on the implementation of the ASCOBANS North Sea Conservation Plan for harbour porpoises – 5 with focus on progress in implementation of Actions 1,3,4,7 & 8 and attempt of characterizing recreational fisheries in CPHPNS area (ICES areas IIIaN, IV, VIIed)              |
| SC/20/HP/O10 | Desportes G. Interim report on the implementation of the ASCOBANS North Sea Conservation Plan for harbour porpoises – 4 with focus on bycatch situation and population monitoring December 2012  |
| SC/20/HP/O11 | Report of the 2nd Meeting of the ‘Steering Group for the Conservation Plan for the Harbour Porpoise in the North Sea’ (ASCOBANS)   |
| SC/20/HP/O12 | Nielsen <i>et al.</i> (2012) Application of a novel method for age estimation of a baleen whale and a porpoise. <i>Marine Mammal Science</i> . 29(2): E1–E23   |
| SC/20/HP/O13 | Lockyer <i>et al.</i> (2001) Age, length and reproductive parameters of harbour porpoises <i>Phocoena phocoena</i> (L.) from West Greenland. <i>ICES Journal of Marine Science</i> . 58: 154–162   |
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| SC/20/HP/O16 | Gilles <i>et al.</i> Harbour porpoise <i>Phocoena phocoena</i> summer abundance in Icelandic and Faroese waters, based on aerial surveys in 2007 and 2010  |
| SC/20/HP/O17 | Hansen & Heide-Jørgensen (2013) Spatial trends in abundance of long-finned pilot whales, white-beaked dolphins and harbour porpoises in West Greenland. <i>Mar Biol.</i> <a href="http://dx.doi.org/10.1007/s00227-013-2283-8">http://dx.doi.org/10.1007/s00227-013-2283-8</a>                         |
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**NAMMCO SCIENTIFIC COMMITTEE  
WORKING GROUP ON WALRUS -  
STOCK STATUS OF WALRUS IN GREENLAND  
8-10 November 2013, Greenland Representation, Copenhagen, Denmark**

**REPORT**

**1. OPENING REMARKS**

Chair Wiig (Norway) welcomed the participants (Address Section 5.7) to the Walrus Working Group meeting of 2013.

There was a request from Council (**R-2.6.6**) to investigate the possibility for catch quota carryover, which will be discussed at this meeting, however the main topic for the meeting will be the standing request for an assessment.

**2. ADOPTION OF AGENDA**

The adopted agenda is in Appendix 1.

**3. APPOINTMENT OF RAPPORTEURS**

Prewitt was appointed as rapporteur, with the help of participants where needed.

**4. REVIEW OF AVAILABLE DOCUMENTS**

The list of available documents (Appendix 2) was reviewed.

**5. STOCK STRUCTURE**

Heide-Jørgensen presented working document SC/20/WWG/04. In this study, a total of 35 walruses during 2010 – 2013 were instrumented with satellite-linked transmitters in Smith Sound, Northwest Greenland. The tags transmitted from 3 – 125 days and one average daily position of good quality was used to identify the movement of the walruses. Thirty-two walruses moved to Canadian waters after instrumentation and 6 walruses furthermore entered Jones Sound in July or August.

The purpose of the study was to obtain correction factors for aerial surveys. Some tagged animals had dive recordings, and those have been published in Heide-Jørgensen *et al.* (2013a and 2013b). This working paper presented only the movement information.

The last tags were put out in June 2013, and the analyses are still pending. Tagging occurred in spring to coincide with aerial surveys, when the walruses are in Greenland. The walruses moved to Canada in July, and returned to Greenland in November, where they stay until spring. When they are in Canada, they are primarily using the fjords on east Ellesmere Island including Jones Sound, but it is not thought that they are hauling out on land on Ellesmere Island. Some animals (both males and females) move to Jones Sound, where hunting is occurring during the summer and fall. It was reported that the walruses were tagged via harpooning, and it was not always known what the sex is of the animal.

The group was informed that tag failures are usually due to physical damage to the tags, *e.g.*, from animals rolling around on the ice or against each other rather than battery exhaustion. It appears that animals that do not haul out as much get better tag durations, likely because there is not as much physical stress on the tag.

The present information does not change the perception of the stock structure: there is a separate stock in northern Baffin Bay with interchange between Greenland and Canada, *e.g.*, the animals spend the winter/spring in Greenland and summer/fall in Canada.

## 6. CATCH STATISTICS

### 6.1 Reported catch

Witting reported that catch histories were used in the assessment (see Fig. 1 from SC/20/WWG/05). These included catches from Greenland, and a few settlements in Canada. SC/20/WWG/05 describes how the catch histories were produced from reported catches (Table 1).

**Table 1.** Reported catches. NR= not reported, NA= not available

| Year | Qaanaaq Area | Grise Fjord | West Greenland | Qikiqtarjuaq | Clyde River | Iqaluit | Pangnirtung | East Greenland |
|------|--------------|-------------|----------------|--------------|-------------|---------|-------------|----------------|
| 1993 | 265          | 12          | 241            | 0            | 0           | 29      | 0           | 15             |
| 1994 | 156          | 24          | 270            | 5            | 0           | 26      | 40          | 10             |
| 1995 | 128          | 5           | 265            | 16           | 0           | 25      | 8           | 11             |
| 1996 | 122          | 8           | 176            | 0            | 1           | 9       | 2           | 7              |
| 1997 | 74           | 12          | 155            | 3            | 0           | 0       | 16          | 1              |
| 1998 | 72           | 11          | 139            | 0            | 1           | 27      | 4           | 7              |
| 1999 | 101          | 5           | 184            | 0            | 0           | 15      | 3           | 10             |
| 2000 | 126          | 4           | 196            | 0            | 0           | 19      | 15          | 7              |
| 2001 | 171          | 2           | 162            | 1            | 1           | 7       | 19          | 10             |
| 2002 | 147          | 3           | 150            | 33           | 0           | 1       | 9           | 34             |
| 2003 | 160          | 7           | 113            | 1            | 0           | 1       | 15          | 11             |
| 2004 | 90           | 5           | 100            | 0            | 2           | NR      | NR          | 4              |
| 2005 | 78           | 2           | 158            | NR           | NR          | 10      | NR          | 16             |
| 2006 | 67           | 5           | 73             | 9            | 1           | 9       | 15          | 5              |
| 2007 | 80           | 4           | 43             | 6            | 0           | 11      | NR          | 10             |
| 2008 | 66           | NR          | 28             | NR           | NR          | NR      | 10          | 9              |
| 2009 | 90           | 7           | 33             | NR           | NR          | 14      | NR          | 4              |
| 2010 | 60           | 2           | 40             | 6            | NR          | 14      | NR          | 7              |
| 2011 | 42           | 4           | 50             | 5            | 0           | 14      | NR          | 5              |
| 2012 | 76           | NA          | 34             | NA           | NA          | NA      | NA          | 4              |
| 2013 | 62           | NA          | NA             | NA           | NA          | NA      | NA          | NA             |

In Greenland, hunters are required to fill out a “special form” (*Særmeldingsskema*) which, among other things, requests information on the sex of each of the catches of walrus.

Examination of the hunter’s “special form” for East Greenland indicated that all walrus caught were males (between 2011-13). This is in agreement with Born *et al.* (1997), which estimated 10% females in the hunt in East Greenland. This value was used for the assessment.

Greenlandic regulations forbid hunting of mature females and calves (except the Qaanaaq area). It is considered likely that the gender reported in the “special forms” in West Greenland is affected by this regulation and the sex ratio is biased towards males. Instead samples from the walrus hunt during 1988-2007, where the gender was determined genetically, were used to estimate a female fraction of 0.59 (Andersen *et al.* 2013) and in the assessment this estimate was applied to catches after 1988 (Table 2). For the hunt in Qaanaaq (Baffin Bay stock), where it is legal to hunt females, no bias was expected in the “special forms” and reports from 2007-2013 were used to derive a weighted average (weight = number of samples) female fraction of 0.39 (SD=0.085). The assessment used an even sex ratio except for the years since 2007 where the reported sex ratios were applied (Table 2).

It was noted that a comprehensive review of Canadian catch history is now available (SC/20/WWG/O06).

**Table 2.** Sex ratio of the Greenland walrus hunt. Genetics data are representative samples from the catch; other data given are from hunters' special forms.

| Year                      | Females | Males | Sum | Prop FF | Reference                      |
|---------------------------|---------|-------|-----|---------|--------------------------------|
| <u>West Greenland</u>     |         |       |     |         |                                |
| 1988-2007                 | 75      | 52    | 127 | 0.59    | Genetics: Andersen et al. 2013 |
| <u>Baffin Bay/Qaanaaq</u> |         |       |     |         |                                |
| 1987-1991                 | 179     | 197   | 376 | 0.47    |                                |
| 1990-91                   | 26      | 37    | 63  | 0.41    | Genetics: Andersen et al. 2013 |
| 2007                      | 23      | 40    | 63  | 0.37    | Hunters' special forms         |
| 2008                      | 10      | 8     | 18  | 0.56    | Hunters' special forms         |
| 2009                      | 38      | 46    | 84  | 0.45    | Hunters' special forms         |
| 2010                      | 24      | 37    | 61  | 0.39    | Hunters' special forms         |
| 2011                      | 8       | 34    | 42  | 0.19    | Hunters' special forms         |
| 2012                      | 31      | 45    | 76  | 0.41    | Hunters' special forms         |
| 2013                      | 25      | 39    | 64  | 0.39    | Hunters' special forms         |
| <u>East Greenland</u>     |         |       |     |         |                                |
| 2011                      | 0       | 5     | 5   | 0.0     | Hunters' special forms         |
| 2012                      | 0       | 4     | 4   | 0.0     | Hunters' special forms         |
| 2013                      | 0       | 5     | 5   | 0.0     | Hunters' special forms         |

## 6.2 Struck and lost

Witting reported that the information about struck and lost is summarized in the assessment paper SC/20/WWG/05 and was obtained from Born *et al.* (1995, 1997 and references therein). These loss rates were used in earlier assessments.

The models include low and high catch histories. The low catch history does not include the struck and lost animals, where the high catch history includes struck and lost. The average loss rate is about 15% for the North Water area and West Greenland, and about 11% for East Greenland.

There is some effect of method of hunting on struck and lost rates. In Qaanaaq, hunters report that they usually harpoon first, and do not shoot from long distances. The working group recognizes that the loss rates used in the assessment may be lower in some areas and in some types of hunts, but more information is required before the numbers used in the assessment can be adjusted.

The working group identified that complete statistics on total removal levels is critical for the assessment, and therefore the group **strongly recommended** that Greenland obtains reliable reports of all animals struck and lost.

## 7. ABUNDANCE AND TRENDS

### West Greenland-Southeast Baffin Island

In the current assessment, the abundance from Stewart *et al.* (2013a) of 2500 animals was used as an estimate of absolute abundance for West Greenland-Southeast Baffin Island.

Stewart *et al.* (2013a) also provided a series of four estimates from 2005 to 2008 of hauled out walrus from Baffin Island. It was decided not to use these estimates as a series of relative abundance because

the number of walruses on a few haulout grounds fluctuates widely and because no site and year specific correction factors were available.

It was noted that the LGL report (SC/20/WWG/O08) provided estimated numbers of walruses in Hudson Strait of 4675 (95% CI= 1845 – 11842) – 6020 (2485 – 14585). Taking into account that it is uncertain to what extent these animals contribute to the West Greenland-Southeast Baffin Island stock, the group did not use this estimate for the assessment.

Heide-Jørgensen presented Heide-Jørgensen *et al.* (2013a) which uses aerial surveys of walruses on the wintering grounds on the banks of West Greenland. In contrast to previous surveys, this survey assumed that animals on ice were constantly available, whereas animals in the water have a correction factor for availability. The detection depth for animals in the water was assumed down to 2 m. There are no area-specific correction factors for animals that were submerged, so correction factors from the North Water were used.

It was noted that effort did not change depending on sea ice cover, since the survey strata were determined beforehand, and were not changed based on where the ice was located at the time of the survey.

There was not a big difference in effort across years. The discussion continued on whether to weight the model by effort since survey areas changed slightly from year to year. Possibilities included correcting for effort by stratum, and/or including total effort (km) versus only the strata where walrus were sighted. The group concluded that since the same core areas with walrus were surveyed in all years, it was not necessary to correct for effort.

The numbers presented in this paper were used as an index of the abundance in West Greenland-Southeast Baffin Island in the current assessment.

The assessment included also an earlier time series (1981 – 1999) of densities of walruses wintering in West Greenland between 66°15 and 68°15 N (SC/17/WWG/04) to provide trend information on a longer time scale.

### **Baffin Bay**

The estimates in Stewart *et al.* (2013b) are similar to, although slightly lower, than those from the North Water reported in Heide-Jørgensen *et al.* (2013b). Stewart *et al.* (2013b) covered the coastal areas in Canadian waters, however they did not survey some locations in Ellesmere Island, and 2009 was the year with the best coverage. This survey did not include all localities visited by animals tagged in Northwest Greenland (SC/20/WWG/04) and it was therefore decided not to include the 2009 estimate in the assessment.

The abundance estimates presented in Heide-Jørgensen *et al.* (2013b) are not statistically different from each other and can be used as a trend. The group discussed the fact that this was a multi-species survey which may affect the perception bias for walrus. However the group agreed that the approach was acceptable given the data available. The correction factors used in this survey were derived from animals tagged in the North Water (SC/20/WWG/04).

The group concluded that these two estimates (1238 CV=0.19 for 2009 and 1759 CV= 0.29 for 2010) should be treated separately for the assessment.

### **East Greenland**

There was no new information from East Greenland (the previous info from SC/WWG/07 was used in this assessment).

## **8. ASSESSMENT BY STOCK**

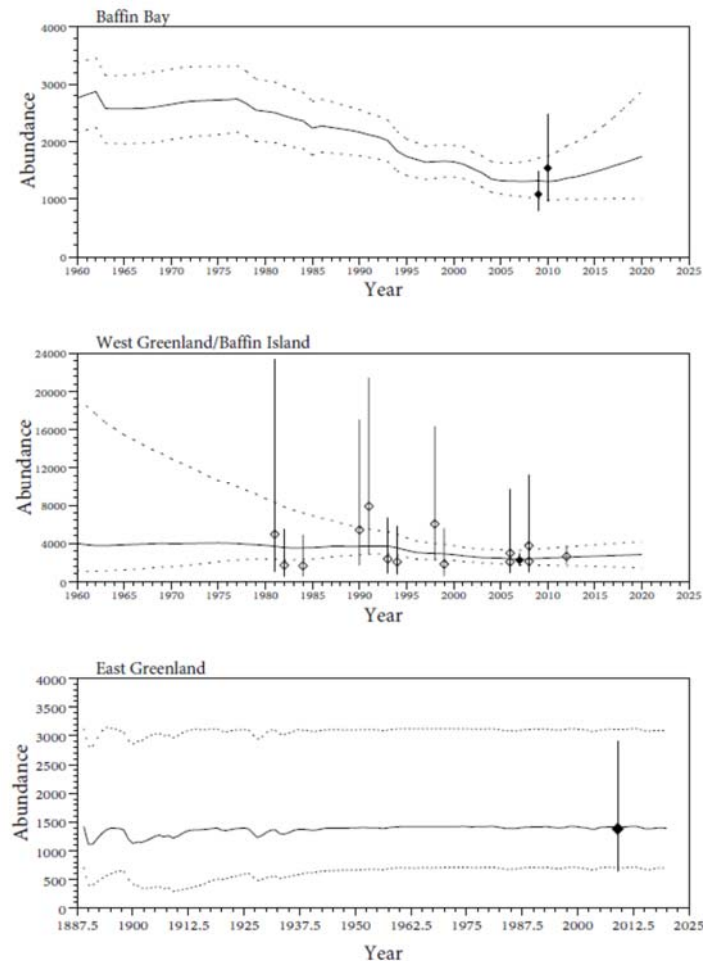


### 8.1 Present status

The historical and current dynamics of the three walrus stocks that occur in Greenland was estimated in SC/20/WWG/05 using age- and sex-structured population models with exponential growth, density-regulated growth and selection-delayed dynamics. These models were integrated with the agreed catch data in a Bayesian framework, where the likelihood of the simulated population trajectories were evaluated from the agreed abundance estimates and the age-structure of a selective hunt in Qaanaaq.

The fit of the model to the age-structured data from Qaanaaq showed an under-representation of animals younger than ten years in agreement with a hunt that takes mainly adult animals. The estimated selectivity is steep and concave, characteristic of selection for full-grown animals, with selection against animals that are almost but not yet fully grown.

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



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

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

A 2014 estimate of 1,400 (95% CI: 720-3,200) walrus in East Greenland has apparently recovered relative to 1888, the year prior to our first historical catches by European sealers. The historical trajectory is uncertain. Density regulation estimates a relatively flat trajectory (Fig. 1, bottom), with a maximum depletion in 1890 to 80% of the initial abundance, and a slow continuous increase to almost no current growth. A recovered stock was also estimated by selection-delayed dynamics providing a continued increase and a historical depletion to 3% in 1957.

Updated abundance estimates for West Greenland, and modelling with age-structured data from Baffin Bay, have generally improved the status estimates for Baffin Bay and West Greenland/Baffin Island.

## 8.2 Management recommendations

### 8.2.1 Sustainable harvest levels

The estimated trade-offs between total removals and the probability of population size increase is shown in Table 3 for the Baffin Bay and the West Greenland-Southeast Baffin Island stocks. A target of a 70% probability for increasing stock sizes from 2014 to 2018 results in recommended total removals of no more than 93 animals from the Baffin Bay stock and no more than 100 animals from the West Greenland-Southeast Baffin Island stock.

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

**Table 3.** The estimated probabilities of increasing stock sizes from 2014 to 2018 for 6 levels of annual removal from the Baffin Bay and West Greenland-Southeast Baffin Island stocks. Canadian and Greenlandic catches and struck and lost walrus are assumed to be included in removals. These removals do not assume a specific sex ratio.

| Removals  | 75   | 80   | 85   | 90   | 95   | 100  |
|---|------|------|------|------|------|------|
| <b>Baffin Bay</b>                                       | 0.94 | 0.86 | 0.81 | 0.75 | 0.67 | 0.58 |
| <b>West Greenland –<br/>Southeast Baffin<br/>Island</b> | 0.87 | 0.85 | 0.81 | 0.78 | 0.74 | 0.70 |

### 8.2.2 Carryover of quotas

**R-2.6.6** The Management Committee requested the Scientific Committee to investigate the possibility to include a carryover for quotas in order to include this possibility in the next hearing for the new quota block period.

The working group discussed the request and **concluded** that there is no biological argument against carryover of quotas. A problem arises if carryovers accumulate over time and/or across assessments.

## 9. RECOMMENDATIONS FOR RESEARCH

The working group **recommended** 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.
- the fraction of the catches and abundances in Canada that belong to the West Greenland-Southeast Baffin Island stock are clarified.
- complete catch statistics from Canada are collated.
- reliable reports of struck and lost are obtained for the entire range of the stocks in Greenland and Canada.
- regular abundance estimates (5-10 years) from Baffin Bay, West Greenland, and the southeast coast of Baffin Island are obtained.

## 10. OTHER BUSINESS

The completed papers in *NAMMCO Scientific Publications Volume 9: Walrus of the North Atlantic* have been published online and are available at <http://septentrio.uit.no/index.php/NAMMCOSP/index>.

Greenland plans to conduct a survey in the North Water in spring 2014 of marine mammals and birds, and will target walrus along the ice edge.

## 11. ADOPTION OF REPORT

The report was adopted in a preliminary form at the end of the meeting on 10 November 2013. The final version was adopted by correspondence on 12 November 2013.

## References

- Andersen, L.W., Born, E.W., Stewart, R.E.A, Dietz, R., Doidge, D.W. and Lanthier, C. 2013. A genetic comparison of West Greenland and Baffin Island (Canada) walrus: Management implications. *NAMMCO Scientific Publications*. Volume 9. doi: <http://dx.doi.org/10.7557/3.2610>
- Born, E. W., Gjert, I., and Reeves, R. 1995. Population Assessment of Atlantic Walrus, *Norsk Pol. Medd.* 138:1–100.
- Born, E. W., Dietz, R., Heide-Jørgensen, M., and Knutsen, L. 1997. Historical and present status of the Atlantic walrus (*Odobenus rosmarus rosmarus*) in eastern Greenland. *Meddr. Grønland, Biosci.* 46:1–73.
- Heide-Jørgensen, M.P., Laidre, K.L., Fossette, S., Rasmussen, M., Nielsen, N.H. and Hansen, R.G. 2013a. Abundance of walrus in Eastern Baffin Bay and Davis Strait. *NAMMCO Scientific Publications*. doi: <http://dx.doi.org/10.7557/3.2606>
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- Stewart REA, Born EW, Dietz R and Ryan AK 2013a. Estimates of Minimum Population Size for Walrus around Southeast Baffin Island, Nunavut. *NAMMCO Sci. Publ.* doi: <http://dx.doi.org/10.7557/3.2615>
- Stewart REA, Born EW, Dietz R, Heide-Jørgensen MP, Rigét FF, Laidre K, Villum Jensen M, Knutsen LØ, Fossette S and Dunn JB 2013b. Abundance of Atlantic walrus in western Nares Strait, Baffin Bay stock, during summer. *NAMMCO Sci. Publ.* doi: <http://dx.doi.org/10.7557/3.2611>

## AGENDA

1. OPENING REMARKS
2. ADOPTION OF AGENDA
3. APPOINTMENT OF RAPPORTEURS
4. REVIEW OF AVAILABLE DOCUMENTS
5. STOCK STRUCTURE
6. CATCH STATISTICS
  - 6.1.1 Reported catch
  - 6.1.2 Struck and lost
7. ABUNDANCE AND TRENDS
8. ASSESSMENT BY STOCK
  - 8.1.1 Present status
  - 8.1.2 Management recommendations
    - 8.1.2.1 Sustainable harvest levels
    - 8.1.2.2 Carryover of quotas
9. RECOMMENDATIONS FOR RESEARCH
10. OTHER BUSINESS
11. ADOPTION OF REPORT

**In a new request (R-2.6.6)**, 6.2 page 16 of annual report 2012: The Management Committee requested the Scientific Committee to investigate the possibility to include a carryover for quotas in order to include this possibility in the next hearing for the new quota block period.

**LIST OF DOCUMENTS**

| Document Number | Title  |
|-----------------|--|
| SC/20/WWG/00    | Practical arrangements   |
| SC/20/WWG/01    | List of participants   |
| SC/20/WWG/02    | Draft Agenda   |
| SC/20/WWG/03    | List of Documents  |
| SC/20/WWG/04    | Heide-Jørgensen <i>et al.</i> Satellite tracking of Atlantic walrus from Northwest Greenland |
| SC/20/WWG/05    | Witting. Revised assessment runs of walrus in Greenland                                      |

**BACKGROUND DOCUMENTS**

|               |   |
|---------------|---|
| SC/20/WWG/O01 | Witting and Born (2013) Population dynamics of walrus in Greenland. <i>NAMMCO Scientific Publications</i> . Vol 9. <a href="http://dx.doi.org/10.7557/3.2612">http://dx.doi.org/10.7557/3.2612</a>  |
| SC/20/WWG/O02 | Stewart and Hamilton (2013) Estimating total allowable removals for walrus ( <i>Odobenus rosmarus rosmarus</i> ) in Nunavut using the potential biological removal approach. DFO Can. Sci. Advis. Sec. Res. Doc. 2013/031. iv + 13 p.               |
| SC/20/WWG/O03 | Stewart, R.E.A., Hamilton, J.W., and Dunn, J.B. 2013. Results of Foxe Basin walrus ( <i>Odobenus rosmarus rosmarus</i> ) surveys: 2010-2011. DFO Can. Sci. Advis. Sec. Res. Doc. 2013/017. iv + 13* p.  |
| SC/20/WWG/O04 | Proceedings of the Pre-COSEWIC Peer Review Meeting for Atlantic walrus ( <i>Odobenus rosmarus rosmarus</i> )  |
| SC/20/WWG/O05 | Canadian catch data   |
| SC/20/WWG/O06 | Stewart DB <i>et al.</i> A catch history for Atlantic walrus ( <i>Odobenus rosmarus rosmarus</i> ) in the eastern Canadian Arctic. (DRAFT- not for further circulation)   |
| SC/20/WWG/O07 | LGL Report- Hudson Strait aerial surveys  |
| SC/20/WWG/O08 | Stewart <i>et al.</i> (2013) Estimates of Minimum Population Size for Walrus near Southeast Baffin Island, Nunavut. <i>NAMMCO Scientific Publications</i> . Vol. 9. <a href="http://dx.doi.org/10.7557/3.2615">http://dx.doi.org/10.7557/3.2615</a> |
| SC/20/WWG/O09 | Stewart <i>et al.</i> (2013) Abundance of Atlantic walrus in Western Nares Strait, Baffin Bay Stock, during summer. <i>NAMMCO Scientific Publications</i> . Vol. 9. <a href="http://dx.doi.org/10.7557/3.2611">http://dx.doi.org/10.7557/3.2611</a> |
| SC/20/WWG/O10 | Heide-Jørgensen <i>et al.</i> (2013) The significance of the North Water polynyas to Arctic top predators. <i>Ambio</i> . 42(5):596-610.  |
| SC/20/WWG/O11 | Heide Jørgensen <i>et al.</i> (2013) Abundance of walrus in Eastern Baffin Bay and Davis Strait. <i>NAMMCO Sci Publ.</i> doi: <a href="http://dx.doi.org/10.7557.3.2606">http://dx.doi.org/10.7557.3.2606</a>                                       |
| SC/20/WWG/O12 | Report from last WWG meeting  |
| SC/17/WWG/07  | Born <i>et al.</i> Abundance of Atlantic walrus ( <i>Odobenus rosmarus rosmarus</i> ) in East Greenland   |



**SECTION 4 – NATIONAL PROGRESS REPORTS**

|            |                      |  |                  |
|------------|----------------------|--|------------------|
| <b>4.1</b> | <b>Faroe Islands</b> | <b>Progress Report on Marine Mammals</b> | <b>..... 241</b> |
| <b>4.2</b> | <b>Greenland</b>     | <b>Progress Report on Marine Mammals</b> | <b>..... 245</b> |
| <b>4.3</b> | <b>Iceland</b>       | <b>Progress Report on Marine Mammals</b> | <b>..... 253</b> |
| <b>4.4</b> | <b>Norway</b>        | <b>Progress Report on Marine Mammals</b> | <b>..... 267</b> |





#### 4.1

### FAROE ISLANDS – PROGRESS REPORT ON MARINE MAMMALS IN 2012

Bjarni Mikkelsen<sup>1</sup>, Dorete Bloch<sup>1</sup>, Maria Dam<sup>2</sup>, Jústines Olsen<sup>3</sup> and Geneviève Desportes<sup>4</sup>

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## 1. INTRODUCTION

This report summarises research on cetaceans and seals conducted in the Faroe Islands in 2012. Research has been conducted by the Zoological Dept., Museum of Natural History, the Environment Agency and the Veterinary Service.

## 2. RESEARCH 2012

### 2.1 Species/Stocks studied

- Pilot whale (*Globicephala melas*) – landed and tagged animals
- Common dolphin (*Delphinus delphis*) – stranded animal
- Grey seal (*Halichoerus grypus*) – hunting statistics

### 2.2 Field work

A “full sample” refers to recordings and samplings of total length, weight (when possible), sex, teeth (lower jaw), ovaries/testes and stomach as well as muscle, blubber, kidney and liver tissues. Foetuses are sampled when present.

In 2012, a total of 33 full samples were collected from **pilot whales** by the Natural History Museum, from 3 drives - Klaksvík on July 10 (10 samples), Tjørnuvík on August 19 (10) and Vestmanna on September 23 (13). This is part of a small-scale opportunistic sampling programme. The future plan is to complement this with a comprehensive monitoring programme, as recommended by NAMMCO, with the aim of updating the extensive 1986-1988 pilot whale study, in order to assess the sustainability of the Faroese catch.

On October 2 the Museum tagged six **pilot whales** with satellite transmitters. A pod counting about 45 whales was spotted close to the shore in the southernmost part of the archipelago and was driven to the bay of Vágur. The pod was driven gently towards the shore of the authorized whaling beach in the bay, where the first ten animals stranded. Six whales were fitted with fin-tags in the tagging operation lasting about one hour. Thereafter, all animals reunited and the pod swam intact to sea again. This is the fourth time pilot whales have been tagged in a dedicated tracking programme, with the objective to study movements and distributions of pilot whales recruiting to the hunt in the Faroe Islands.

On 22 May, a **common dolphin** stranded in Hvalvík. Three days earlier, the Museum had been informed about two common dolphins, which had followed a fishing vessel from the fishing ground south of the Faroes, and all the way to the harbour in Toftir, where they were photographed and could be identified. This is the third record of common dolphin from the Faroes. The Museum secured the specimen for its collection.

The Environment Agency took samples of muscle and blubber from 23 **pilot whales** from the Klaksvík 10 July, 2012 drive, in addition to samples of liver and kidney tissue from 16 of these. At the drive kill in Hvannasund 9 August 2012, samples of muscle and blubber were taken of from 24 whales; kidney and liver samples were taken from 21 and 18 individuals respectively.

A PhD study on negative effects of pollutants on hormone and vitamin concentrations in Pilot whales were in progress as was a MSc study on Pilot whale brain neurons and glial cells.

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](http://www.whaling.fo)). Reference is made to information submitted by the Faroe Islands to the NAMMCO Committee on Hunting Methods.

During the summer Planet Whale and WSPA were running a land-based cetacean survey project, observing cetaceans in near-shore waters, to explore the potential for whale watching activities in the Faroes.

### 2.3 Laboratory work

The biological material collected from **pilot whales** in 2012 has been prepared ready for finalizing the age, diet and reproduction examinations.

When possible, the Environment Agency performs tissue sampling for contaminants analyses from two **pilot whale** drives a year. The samples taken are primarily blubber and muscle and from a smaller selection of animals, mainly the older/larger ones, also kidney and liver. The samples are stored in the Environmental Specimen Bank at -20°C until analysis. Muscle samples are analysed for mercury, and blubber samples for persistent organic pollutants such as PCB and “legacy” pesticides like DDT. 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](http://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](http://www.envofar.fo)).

### 2.4 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 observations and seal culls was implemented. Farmers were motivated to record the cull and deliver statistics once a year. For some of the installations, the reporting system is still not optimal.

### 2.5 Research results

The satellite tags mounted on **pilot whales** on 2 October 2012 transmitted for up to 125 days. During the first five days, the pod stayed at the islands. Then the group moved east, out to the deeper Faroe- Shetland Channel area. After one month, one tagged animal started moving east, toward the Norwegian coast. When reaching the shelf, it turned north, following the shelf slope, and was approaching the Frøya Bank, when contact was lost, after 49 days. After two months, the main group located in the Faroe- Shetland Channel area started to migrate south. When reaching the Rosemary Bank, the pod swam westward, out into the deeper Iceland Basin. Thereafter the group moved south again, to the Edoras Bank, and from there on in a south-west direction until the group reached the Mid-Atlantic Ridge. The group was located on the Mid-Atlantic Ridge when the tracking failed. At this stage the group was 1300 nautical miles away from the tagging location, and the nearest land was the Azores, 350 nautical miles south.

An analysis of relative abundance and trend of **pilot whales** from the three widest sightings survey, i.e. 1989, 1995 and 2007 (Pike et. al. in prep), as recommended by NAMMCO, did not reveal any trend in the abundance, that was significantly different from 0.

## 3. ONGOING (CURRENT) RESEARCH

The Museum of Natural History is planning to track more pods of **pilot whales** by satellite telemetry, in order to assess the overall distribution area of the pilot whales recruiting to the Faroese harvest. In 2013 the Museum will be able, if the opportunity occurs, to tag animals from another two pods.

#### 4. CATCH DATA

Contained in appendix.

#### 5. BY-CATCH DATA

Reporting of by-catch of marine mammals has until now not been mandatory. But a new electronic logbook system for all vessels has now been implemented for some fleets, where also by-catch of marine mammals is reported. By-catches of large whales have traditionally been reported directly to the Museum.

#### 6. ADVICE GIVEN AND MANAGEMENT MEASURES TAKEN

None.

#### 7. PUBLICATIONS AND DOCUMENTS

Bloch, D., Desportes, G., Harvey, P., Lockyer, C. and Mikkelsen, B. 2012. Life History of Risso's Dolphin (*Grampus griseus*) (G. Cuvier, 1812) in the Faroe Islands. *Aquatic Mammals*, 38(3), 250-266.

Bloch, D. 2012. Avgustur í Føroyum. *Frøði* 17,1: 20-21.

Mikkelsen, B., Bloch, D., Dam, M., and Desportes, G. 2012. Faroe Islands – Progress report on Marine Mammals 2011. Paper presented to the NAMMCO Scientific Committee, Tasiilaq, Greenland, April 2012. 6pp.

Rotander, A., van Bavel, B., Rigét, F., Auðunsson, G., Polder, A., Gabrielsen, G., Víkingsson, G., Mikkelsen, B. and Dam, M. 2012. "Polychlorinated naphthalenes (PCNs) in sub-Arctic and Arctic marine mammals, 1986-2009." *Environmental Pollution* 164, 118-124.

Rotander, A., van Bavel, B., Rigét, F., Auðunsson, G., Polder, A., Gabrielsen, G., Víkingsson, G., Mikkelsen and B., Dam, M. 2012. "Methoxylated polybrominated diphenyl ethers (MeO-PBDEs) are major contributors to the persistent organobromine load in sub-Arctic and Arctic marine mammals, 1986-2009" *Science of the Total Environment* 416, 482-489.

Rotander, A., Kärrman, A., van Bavel, B., Polder, A., Rigét, F., Auðunsson, G., Víkingsson, G., Gabrielsen, G., Bloch, D. and Dam, M. 2012. "Increasing levels of long-chain perfluorocarboxylic acids in Arctic and North Atlantic marine mammals, 1984-2009." *Chemosphere* 86, 278-285.

Rotander, A., van Bavel, B., Polder, A., Rigét, F., Auðunsson, G., Gabrielsen, G., Víkingsson, G., Bloch, D. and Dam, M. 2012. "Polybrominated diphenyl ethers (PBDEs) in marine mammal from Arctic and North Atlantic regions, 1986-2009". *Environment International* 40, 102-109.

## Catch data 2012

| Pilot whale drives in the Faroe Islands, 2012. |                  |                   |               |
|--|------------------|-------------------|---------------|
| Date   | Locality         | Number of whales  | Samples taken |
| 16 May   | Trongisvágur     | 62                |               |
| 5 June   | Sandur           | 125               |               |
| 10 July  | Klaksvík         | 42                | 10            |
| 8 August                                       | Vágur            | 195               |               |
| 9 August                                       | Hvannasund       | 32                |               |
| 19 August                                      | Tjørnuvík        | 61                | 10            |
| 24 August                                      | Hvalba           | 70                |               |
| 18 September                                   | Sandavágur       | 21                |               |
| 23 September                                   | Vestmanna        | 27                | 13            |
| 24 October                                     | Hvalba           | 36                |               |
| 24 November                                    | Fuglafjørður     | 40                |               |
| 24 November                                    | Hvalba           | 2                 |               |
| <b>2012</b>                                    | <b>12 grinds</b> | <b>713 whales</b> | <b>33</b>     |

| Drives and stranding of species other than <i>G. melas</i> in the Faroe Islands, 2012 |              |          |                             |              |
|---|--------------|----------|-----------------------------|--------------|
| Date  | Locality     | Number   | Species                     | Full samples |
| 20 May  | Hvalvík      | 1        | <i>D. delphis</i>           | 1            |
| 30 August 2012  | Sandvík      | 2        | <i>L. ampullatus</i>        | 2            |
| <b>2012</b>   | <b>1 pod</b> | <b>1</b> | <b><i>D. delphis</i></b>    | <b>1</b>     |
| <b>2012</b>   | <b>1 pod</b> | <b>2</b> | <b><i>L. ampullatus</i></b> | <b>2</b>     |

## 4.2

### GREENLAND - PROGRESS REPORT ON MARINE MAMMALS IN 2012

Greenland Institute of Natural Resources, Nuuk

Catch statistics provided by the Department of Fisheries, Hunting and Agriculture

#### 1. INTRODUCTION

This report summarizes the research on pinnipeds and cetaceans done in Greenland in 2012 by The Greenland Institute of Natural Resources (GINR), in collaboration with several organizations, including: Greenland Fisheries License Control (GFLK, Greenland), Marine Research Institute (Iceland), Norwegian Polar Institute (Tromsø), Swansea University (Wales), University of Iceland, University of Aarhus, University of Washington, University of Copenhagen, University of Oslo, University of St Andrews, Department of Fisheries and Oceans (Canada), Wood Hole's Oceanographic Institution (USA), Alaska Department of Fish and Game and New York University. An update of ongoing events from January to October 2013, is also included.

#### 2. RESEARCH 2012

##### 2.1 Species and stocks studied

###### Pinnipeds

- Walrus *Odobenus rosmarus* – Northern Baffin Bay & West Greenland /Southern Baffin Island
- Hooded seals *Cystophora cristata* – South Greenland (Western Atlantic)
- Harbour seal *Phoca vitulina* – Central West and South Greenland
- Bearded seal *Erignathus barbatus* – Baffin Bay and South Greenland
- Ringed seal *Pusa hispida* – Baffin Bay and South Greenland
- Harp seal *Pagophilus groenlandicus* – South Greenland

###### Cetaceans

- Bowhead whale *Balaena mysticetus* – West Greenland
- Narwhal *Monodon monoceros* - West and East Greenland
- Humpback whale *Megaptera novaeangliae* - West Greenland
- Fin whale *Balaenoptera physalus* – West Greenland
- Minke whale *Balaenoptera acutorostrata* – West Greenland
- Harbour porpoise *Phocoena phocoena* – West Greenland
- Sperm whale *Pyseter macrocephalus* – West Greenland

##### 2.2 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 10 walruses with satellite senders at the ice edge in the North Water Polynia.

An aerial survey for walrus and cetaceans is mentioned under the cetacean section below.

###### Seals

The harbour seal is classified as “Critically Endangered” in the Greenland Red List, and its conservation requires immediate action. Despite reports of sporadic observations, no stable colonies have been identified in recent years north of Cape Farewell. Based on information gathered from catch reports and interviews with locals in several parts of West Greenland, 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. However, due to technical (mechanical) and logistic problems, it was not possible to monitor the sites in 12.

As part of a series of environmental studies for hydrocarbon development, in collaboration with the University of Aarhus, wildlife officers and hunters from Upernavik, GINR attempted to tag bearded seals in the ice edge in Baffin Bay.

Collection of stomach samples and other tissues from the seal harvest in Appilartoq, Cape Farewell ended in 2011, and a similar project started in Ilulissat, focusing in the Icefjord in Disko Bay. The aims of these projects 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, 1 ringed seal was tagged with a satellite transmitter in Sermilik Fjord, South of Tasiilaq in East Greenland and three 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**

A spring survey for narwhal, beluga, walrus and bowhead whales off West Greenland was carried out in April. This was an aerial survey using line transect distance-sampling double observer methodology.

With the aim of mapping migration routes and understanding stock structure, GINR attempted to tag narwhals and belugas in Northwest Greenland (Qaanaaq, Upernavik and Uummannaq) and narwhals in East Greenland (Scoresby Sund). In East Greenland a field station for studies and instrumentations of narwhals was established (at Hjørnedal in Scoresby Sound) and 6 narwhals were live captured and instrumented with satellite transmitters. This work was done with the help of local hunters. One narwhal was tagged from a kayak by a hunter in the North Water Polynia in Qaanaaq in June 2012 and two narwhals were tagged from kayak by hunters in Melville Bay in August 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. The recorders were made using a high frequency hydrophone array that should allow for estimating source levels in a full frequency spectrum.

Using an innovative research method, 2 harbour porpoises were herded into nets by hunters working together with researchers in Maniitsoq during summer 2012. The porpoises were equipped with satellite transmitters attached to their dorsal fins and both were still operating in October 2013.

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 50 biopsies from bowhead whales in Disko Bay between March and May. The samples are being used for sex determination, genetic identification and stock identity.

To obtain dive data for calibration of aerial surveys, hunters from Qeqertarsuaq, attempted to attach satellite transmitters to minke whales in Disko Bay during summer. This is a difficult task, for which methodology is under development. The fieldwork in 2012 was unsuccessful, partly due to inclement weather.

As in previous years, the occurrence and site fidelity of humpback whales in Nuuk fjord 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. Identification pictures were obtained from 110 encounters with humpback whales (46 individuals).

A program to collect stomach samples, body measurements and a variety of tissue samples from the humpback whale catch was complemented with a study of prey choice using a combination of

multisensory tags attached with suction cups (DTAG), trawling and hydro-acoustic measurements using a scientific eco-sounder. DTAGS were attached to 7 humpback whales for a total of 40 hours.

Steps were taken to expand the collection of samples from the catch of humpback whales and fin whales, to also include measurements of the amount of edible products from the harvest. This expansion intends to comply with requirement by IWC to collect data that can contribute to the quantification of Greenland's need of whale meat. The work in 2012 consisted of establishing protocols and initiating dialogue with the organisations of fishermen and hunters and the Department of Fisheries, Hunting and Agriculture.

As part of the requirements for obtaining a whaling licence, hunters from West Greenland provided GINR with tissue samples from 112 minke whales, 7 humpback whales and 3 fin whales, while 4 minke whales were submitted from East Greenland.

The seasonal acoustic activity of large whales and bearded seals was monitored by an array of recorders moored to the seabed at six locations in the Davis Strait and Baffin Bay. The moorings deployed in October were redeployed, and in some cases re-located in September 2012. Passive acoustic monitoring in East Greenland started in 2012, with the deployment of a recorder moored off Sermilik, Tasiilaq, in cooperation with the University of Washington and Woodshole Oceanographic Institution. There was an unprecedented level of seismic exploration in the Baffin Bay during August and September 2012. Because of this, the Bureau of Minerals and Petroleum commissioned three studies aimed at better understanding the effects of sound from seismic air guns in the narwhals summering in Melville Bay. In the first study, an array of bottom mounted and drifting instruments was used to record seismic sounds at the bottom, middle and shallow layers of the water column in Baffin Bay. The second study consisted of a series of aerial surveys for estimating abundance and distribution of narwhals in Melville Bay during the early, middle and late phases of seismic surveys. The third and last study was aimed at gathering information about the narwhal hunt and the way hunters perceive effects of seismic activities.

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. In 2012 there were surveys in Baffin Bay and Northeast Greenland.

### **2.3 Laboratory work in 2012**

Laboratory work carried out in 2012 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.

Age determination of narwhals was conducted with aspartic acid racemization method at the University of Copenhagen.

### **2.4 Other studies in 2012**

A number of desktop studies were carried out during 2012, including analysis of catch statistics and assessments of narwhals and belugas for the NAMMCO/JCNCB SWG and of large whales for the IWC.

In 2012, Nynne Hjort Nielsen obtained a grant for a PhD study on the ecology of harbour porpoise in West Greenland. The study started in 2013

### **2.5 Research results in 2012**

#### **Walrus**

The data from the walrus studies from 2012 have been incorporated into abundance estimates for walruses in the North Water Polynia.

#### **Seals**

Seal tagging at the sea ice in Baffin Bay was not successful. This was a pilot project and useful experience was obtained.

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

### **Cetaceans**

The majority of research results from the fieldwork of 2012 are not available yet.

## **3. ONGOING RESEARCH IN 2013**

As in previous years, GINR focuses on identifying important areas for harbor seals in order to implement monitoring programs. The new haulout site identified in 2012 in the municipality of Sermersooq was visited in 2013. The presence of three females with cubs suggests that this location may seasonally contain a stable breeding colony. In relation with hydrocarbon exploration in Baffin Bay, a satellite-tagging program on ringed seals and bearded seals started in 2011. Data from this program is being analyzed and a report is scheduled for 2014. Tagging of ringed seals in the vicinity of Ilulissat for obtaining oceanographic data (temperature at depth) with the help of seals continued in 2013. A similar study that started in Southeast Greenland in 2012 continued in 2013.

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 (and polar bears) in West Greenland, as well as narwhals in East Greenland. The use of stomach temperature sensors to document feeding events of narwhals were tested at the field station in East Greenland in 2013.

The final season recording narwhal sounds in the pack ice of Baffin Bay was carried out in 2013.

The long term studies of bowhead whales in Disko Bay for 2013 include 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.

Collection of identification pictures of humpback whales flukes and dorsal fins from West Greenland continued throughout 2013. The work in Nuuk was expanded to include, besides photo-identification and biopsy sampling, also Passive Acoustic Monitoring through bottom moored hydrophones and satellite telemetry of humpback whales and sperm whales. The expansion of activities was motivated by the need to gather baseline data before the establishment of a large scale iron mine.

Biological samples and empiric data on the weight of edible products were obtained in cooperation with whale hunters in 2013. 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.

Passive acoustic monitoring (PAM) of large whales and bearded seals in Davis Strait and Baffin Bay continued until September 2013. PAM off Southeast Greenland will continue throughout 2013 & 2014. These studies are aimed at gathering information for environmental impact assessments and studying the relationship between sea ice and marine mammals.

## **4. ADVICE GIVEN AND MANAGEMENT MEASURES TAKEN**

As during 2011, in 2012 quotas and catches followed the biological advice given by NAMMCO and/or the International Whaling Commission for all the cetacean and pinniped species whose catch is regulated by quotas.

In 2012 there was new advice for the catch of large whales for the period 2013-2017 from the Scientific Committee of the International Whaling Commission (IWC). The advice was 178 minke whales, 19 fin



whales, 10 humpback whales and 2 bowhead whales for West Greenland, and 12 minke whales from East Greenland. The IWC did not take any decision about quotas beyond 2012, and Greenland allocated itself quotas in accordance with advice from the Scientific Committee. In 2013, the IWC Scientific Committee reiterated the advice from 2012, with the exemption of minke whales in West Greenland, where quotas should be reduced to 164 whales per year. There was no commission meeting in 2013, and no new wording in the schedule about quotas. In absence of advice from IWC, it will be up to Greenland to set quotas for large whales in 2014.

The NAMMCO/JCNB JWG met in 2012, and based on its advice NAMMCO restated the previous advice on harvest levels for narwhals and belugas. Greenland quotas for narwhals and belugas in 2012 and 2013 were in accordance with NAMMCO's advice. In 2012, the NAMMCO Management Committee for Cetaceans reiterated previous recommendations from 2000 that the catch of belugas south of 65°N should be banned, in order to allow for the reestablishment of belugas in areas where they were abundant before the 1930's. Contrary to the advice, as in previous years during 2012 and 2013 there was still a quota of 5 belugas for the area south of 65°N (Nuuk to Nanortalik).

In June 2013, the minister of hunting and agriculture announced in a press conference that there would be unlimited catches for walrus, narwhal and beluga in Qaanaaq. Quotas remained unchanged until October 2013, when the walrus quota in Qaanaaq was raised with 10 animals. The new quota was higher than the NAMMCO advice from 2010, current at that time. New advice for walrus is expected when NAMMCO reviews the report of its Scientific Committee Working Group on Walrus, who met in November 2013.

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#### 4.3

### ICELAND - PROGRESS REPORT ON MARINE MAMMALS IN 2012

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## 1. INTRODUCTION

The following reports on studies on marine mammals in Icelandic and adjacent waters in 2012. While most of the studies were conducted by the Marine Research Institute (MRI) and its 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 BioPol ehf. a Marine Biotechnology Science Hotel in Skagaströnd; Húsavík Research Centre (HRC), Húsavík Whale Museum (HWM); Faxaflói Cetacean Research project (FCR), Innovation Centre, Iceland (ICI); Institute of Freshwater fisheries (IFF); Keldur, Institute for Experimental Pathology (KIEP); The Icelandic Seal Centre (ISC); 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. As in previous years research efforts on marine mammals at the MRI in 2012 were largely devoted to the wide ranging research programme on common minke whales initiated in 2003 and the results of recent sightings surveys. Progress of the programme is reported under respective headings according to the guidelines for national progress reports submitted to NAMMCO. Laboratory work continued in a comprehensive biological sampling programme from the commercial catch of fin whales initiated in 2009, but no catches were taken in 2012.

The INH is responsible for collection and preservation of museum specimens of marine mammals in Iceland. The institute also works on historical stranding records and conducts biological investigations on an opportunistic basis.

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.

## 2. RESEARCH 2012

### 2.1 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*)

Sowerby's beaked whale (*Mesoplodon bidens*)  
Long-finned pilot whale (*Globicephala melas*)  
Killer whale (*Orcinus orca*)  
White-beaked dolphins (*Lagenorhynchus albirostris*)  
Striped dolphin (*Stenella coeruleoalba*)  
Harbour porpoise (*Phocoena phocoena*)

## **2.2 Field Work**

### **Pinnipeds**

#### ***Analyses of abundance and trends***

An aerial grey seal pup count was conducted in the autumn of 2012 by ISC, IFF, Biopol ehf. and the MRI. Grey seal pups were counted by flying over all known breeding sites, along the coast of Iceland, at least once and over the major breeding sites at least 3 times. This was the 11th time that aerial grey seal pup counting surveys have been conducted in Iceland.

A comprehensive seal count was carried out for the sixth year in a row in Húnaflói bay by the Icelandic Seal Center. Counting was carried out by several volunteers on 22nd of July 2012 during 3 hours around low tide. All seals on the coastline of Vatnsnes and Heggstaðanes peninsulas in Húnaflói bay were counted (100 km). The number of seals in the area will be monitored by repeating the count annually. 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 2012 the ISC received reports of two ringed seals and one harp seal sighted alive.

#### ***Live history***

In a special sampling effort initiated in 2007 and continued to date by BioPol ehf., Skagaströnd, NW Iceland, seals have been collected for studies on the life history parameters, diet, body condition, genetics and pollutant burden. The animals came from direct hunt and as bycatch from the artisan gillnet lumpfish fishery.

#### ***Interaction with salmon fishery***

A study on the effect of seals on salmonids was initiated in 2009. The project is cooperation between ISC and IFF and is a 4 year program. The main goal is to determine feeding habits of seals in river mouth, especially in regards of the effect of seals on salmonids. The field work includes radio-tagging seals (16 tagged, none in 2012) in river mouths to monitor their presence there during the summer, counting the seals there at different times of the years and collecting samples for feeding analyses.

### **Cetaceans**

#### ***Strandings***

Information on stranded cetaceans in Iceland is compiled by the MRI in cooperation with the INH and other relevant institutions (Table 1). 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 s.a. 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.

In 2012, 17 incidents of cetacean strandings were recorded by the MRI, all single animals. None of these were known to have stranded alive (see though section on pilot whales below). This is similar to 2009 - 2011, but considerably less than in 2008 when the number of reported strandings was record high. In 2012, the most commonly stranded cetacean species was the sperm whale, 5 strandings with no apparent spatial or temporal pattern.

**Table 1. Cetacean strandings in 2012**

| Species                   | Stranding events <sup>6</sup> |
|---------------------------|-------------------------------|
| Northern bottlenose whale | 2                             |
| Sperm whale               | 4                             |
| Killer whale              | 1                             |
| Harbour porpoise          | 2                             |
| Humpback whale            | 2                             |
| Pilot whale               | 2                             |
| Sowerby's beaked whale    | 1                             |
| Striped dolphin           | 1                             |
| Unidentified whale?       | 2                             |
| <b>Total</b>              | <b>17</b>                     |

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.

#### *Pilot whale "mass stranding"*

On 28<sup>th</sup> July 2012 a large group of long-finned pilot whales was seen close to shore in Njarðvík, Reykjanesbæ, SV Iceland. The group was estimated as around 300 whales and came to within few meters of the shoreline. Three individuals beached in the rocky shoreline but were pushed seawards by the local people. The whales eventually turned away from shore and were seen in the area the following day (29/7) around 300m from shore. The next day (30<sup>th</sup> July) a somewhat smaller group (possibly a part of the previous group) came very close to shore by the town Akranes 20nm NE of the earlier stranding site. As in Njarðvík two days earlier, few individuals stranded and were pushed back at sea. These events attracted large attention in this highly populated area including fishing boats, recreational boats and commercial whale watching vessels. It is not clear whether herding effort by these boats had any effect on the events nor in which direction (seawards or shorewards) any such potential effects were likely to be.

#### ***Data from commercial catch***

Sampling and measurements of common minke whales were conducted for the MRI by personell onboard the vessels.

#### ***Sightings data***

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 minimum population size, site fidelity, distribution and occurrence of cutaneous disorders and epizoa mainly in minke whales and white-beaked dolphins. Peduncle scarrings were studied in humpback whales and compared with the Skjálfandi Bay area too.

Sightings data were recorded onboard whaling vessels.

Data collection to assess the impact of whale watching activities on the behaviour of minke whales continued in Faxaflói bay.

<sup>6</sup> All single animals.

### ***Telemetry data***

The MRI's satellite tracking programme continued, resulting in tracking of two humpback whales [during](#) September-November 2012. Attempts to tag common minke whales in the spring and autumn of 2012 were unsuccessful.

### ***Biopsy sampling***

Skin biopsies were collected by the MRI from 8 humpback whales in satellite tracking cruises in 2012. These samples are used in studies on population structure and to determine the gender of the tracked animals.

### ***Natural marking***

Catalogues of individuals based on natural marking data are held at the MRI for blue, humpback and killer whales. Photographs are obtained in special cruises as well as from opportunistic platforms. In 2012 photos of humpback and blue whales were collected in near shore North Icelandic waters and killer whale photos were obtained from Breiðafjörður, W-Iceland. As a follow up a new project on killer whale ecology and behaviour was initiated in 2012 as a three year post-doc study at the MRI with sampling around Snæfellsnes peninsula in winter and Vestmannaeyjar in summer. The MRI cooperates with various scientific bodies for matching photos from Iceland with photos from other areas within the North Atlantic.

The HWM has collected photo-id pictures (April-September mainly) using whale watching vessels in Skjálfandi Bay since 2001. The photo-ID Catalogue (2004-2012), updated in collaboration with the Husavik Research Centre, currently counts 105 common minke whales, 301 white-beaked dolphins and 248 humpback whales.

### ***Behaviour***

A project to study the effects of the whale watching boats on the distribution and behaviour of whales was continued at the HRC 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/>).

An assessment of the conduct of whale watching operations in Skjálfandi bay (NE Iceland) with respect to international and domestic guidelines was continued (Martin 2012) as well as a study on the effects of whale watching vessels on the behaviour of minke whales in Faxaflói bay (SV Iceland) (Christiansen, Rasmussen, *et al.* 2013).

A three-year post-doc study on termed: “Adaptability of foraging strategies of a top marine predator, the killer whale” was initiated at eh MRI in 2013.

In June 2012 two blue whales were instrumented with acoustic tags in Skjálfandi bay as a part of an international collaborative project.

An Ecological Acoustic Recorder (EAR) was deployed in August in the Denmark Strait.

## **2.3 Laboratory work**

### **Pinnipeds**

#### ***Age determination***

Some of the seals collected by Biopol for food studies were aged in 2012, from GLGs' in canine teeth.

#### ***Feeding behaviour***

The diet of harbour seals that haul out in river mouths in the north west of Iceland was investigated in a study made by IFF and the ISC. A special effort is put on investigating the effect of seals on salmonids. Faecal samples from seals hauling out in the river moth area of Bjargaós and Sigríðastaðaós in Húnaþing vestra collected between 2009 and 2011 were analysed. The prey species eaten by the seals were investigated by analysing otoliths and hard-parts found in the samples. 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 and will be analysed for stable isotopes for comparison purposes.

### ***Other***

Every known haul-out site of harbour seals and breeding and moulting sites of grey seals in Iceland, has been recorded into a database, by ISC personnel. Places names related to seals and sealing in Iceland are being recorded into another database, with historical content added.

### **Cetaceans**

During 2003-2007 a wide ranging research programme concerning common minke whales was conducted in Icelandic waters including sampling of 200 minke whales (for details see MRI 2003). Progress has been reported to the Scientific Committees of NAMMCO and the IWC (see e.g. Víkingsson *et al.* 2009, NAMMCO 2009). A formal review of the results from the programme under the auspices of the Scientific committee of the IWC is scheduled in February 2013. The status of different sub-projects of the programme to date is discussed under the representative sections below.

### ***Diet composition***

Increasing knowledge on feeding ecology of common minke whales is a primary objective of the research programme. The study uses several independent methods to assess diet composition including stomach content analysis (primary method), fatty acid analysis and stable isotope ratios. Statistical analysis was finalized in 2012 and the results submitted to the IWC in late 2012 for a review at a special workshop in February 2013.

### ***Energetics***

Laboratory analysis on the energy density of various tissues (muscle, blubber, visceral fat liver and kidneys) is completed and preliminary report submitted to the IWC special panel review. Energetic model to estimate seasonal blubber storage has been developed (Christiansen, Víkingsson *et al.* 2013).

### ***Multi-species modelling***

Work continued on the development of a multi-species model including minke whales as a PhD project at the University of Iceland and the MRI.

### ***Environmental contaminants***

Laboratory work on organic and inorganic contaminants in various tissues collected as a part of the minke whale research programme is completed and some preliminary results have been published (Dam *et al.*, Rotander *et al.* 2011, Auðunsson and Víkingsson 2012).

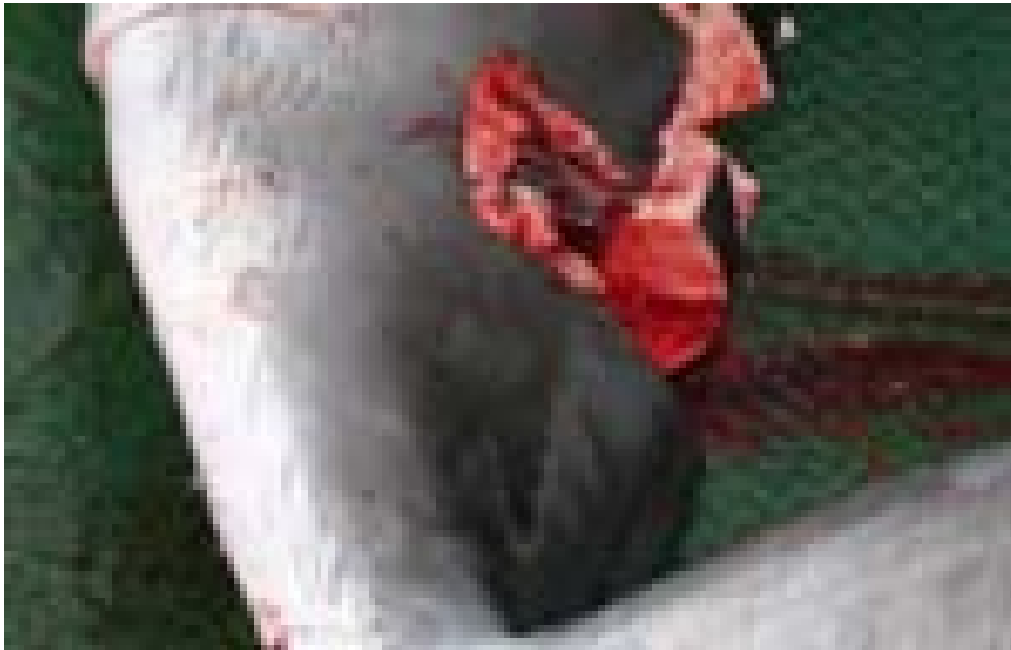
### ***Analyses of abundance and trends***

Analysis of sightings data collected under TNASS-2007 and planning of TNASS-2015 continued at the MRI in cooperation with the other participating nations. Data collection and evaluation on the distribution of cetacean species in the Bay of Skjálfandi in relation to environmental variables was continued at HWM.

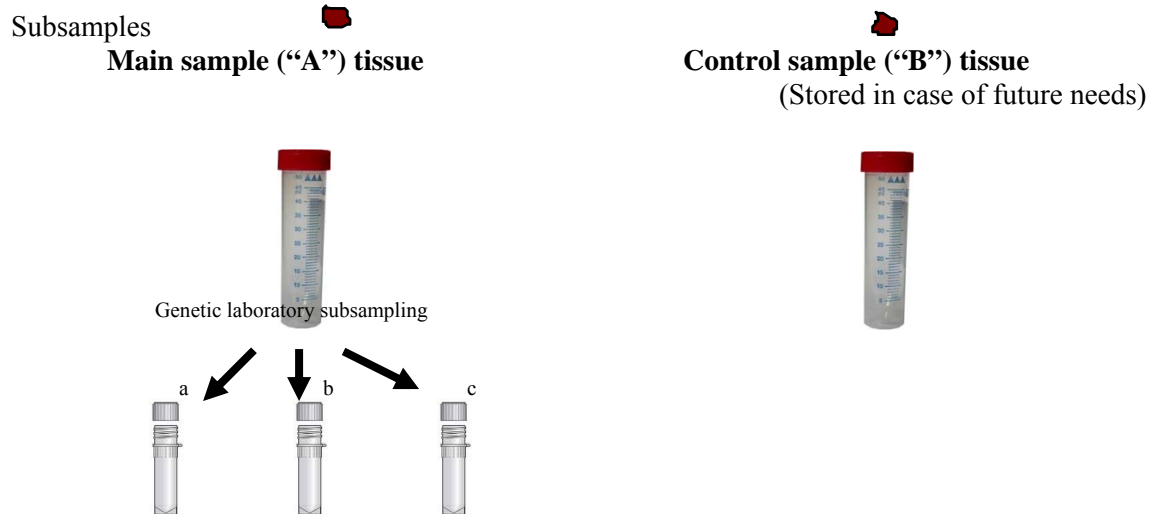
### ***Genetics***

A DNA registry research program was initiated at the MRI in 2010. This includes the development of a tissue bank in which all genetic samples collected from cetaceans (commercial hunting, stranding and biopsy) will be registered with a unique ID number, and a DNA database in which all samples genotyped with genetic markers are recorded. The establishment of the tissue bank was completed in 2012. Samples from other marine mammals (seals, etc.) were recorded too, both in the tissue bank and the DNA database. Frozen archived samples from all marine mammals species were re-sampled for future genetic analyses and stored in the tissue bank (in several 2ml alcohol tubes) – see protocol below in Fig. 1. Collaboration with the University of Potsdam has been initiated to make use the existing 1,300

harbour porpoise samples from Iceland (1991 onwards) and future samples in a wide genetic study. The DNA registry protocol for marine mammals is described below and was presented at the IWC/SC65a in 2012.



Marine mammals tissue sample



**Figure 1.** DNA registry protocol for marine mammals

### ***Life history parameters***

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 2011. The results of the different methods will be compared for estimating their reliability. Analyses of ovaries and testes from the commercial hunt in 2009 and 2010 are completed.

### ***Natural marking***

Analysis of all available photo-id material on humpback whales in Icelandic waters (archived at the MRI) is at a final stage. In 2012 new material on humpback, killer and blue whales was added to the

catalogue. A special database for cetacean photos and associated data has been created at the MRI. This database will serve as a central archive for photo-id material from Icelandic waters and should facilitate comparisons with photo-id collections from other areas.

Studies conducted from commercial whale watching vessels included photo-id studies on common minke whales and white-beaked dolphins, humpback and killer whales in Faxaflói Bay. In 2012 the FCR photo-identified 380 common minke whales, 379 white-beaked dolphins, 87 humpback whales and 8 killer whales.

## **2.4 Other studies**

A collaborative study between MRI scientists and colleagues from Norway and Scotland on stock structure and movements on killer whales in the North-eastern Atlantic was continued in 2011 (Foote *et al.* 2012, Samarra *et al.* 2012.).

The Institute of Natural History archives mammal skeletons and bone remains discovered from soil including marine mammals. The archive includes about 200 specimens, mostly from walruses. Information on occurrences of Walruses found in Iceland has been collected over many years. This includes live and dead animals, historical and recent. Included are also skeletal remains from the natural environment and archaeological material from middens. Cleaning and preservation of a blue whale skeleton from a stranding event in 2010 is at a final stage.

Whale strandings database project: Information on strandings of whales found in Icelandic waters has been collected over many years. This includes dead whales, ice-locked live animals and live animals driven ashore, historical and recent.

## **2.5 Research results**

### **Pinnipeds**

An aerial grey seal pup survey conducted in the autumn of 2012 gave an estimate of pup-production of 990 (95% CI: 900 – 1070) and resulted in an estimate of 4200 (95% CI: 3400 – 5000). This is much lower than the estimate that was made in 2008/9 with the same methodology, 6100 (95% CI: 4600 – 7600).

The result of the sixth comprehensive seal count in Vatnsnes peninsula on 22nd of July 2012 resulted in a count of 618 harbour seals, considerably fewer than in 2011 when the result was 1033 seals (Granquist and Hauksson 2013) .

### **Cetaceans**

MRI's satellite tracking program resulted in tracking of two humpback whales for 31 and 42 days in the autumn of 2012.

An analysis of changes in minke whale distribution and abundance by season and over time in aerial surveys off Iceland 1986-2009 was presented to the IWC SC in June (Gunnlaugsson *et al.* 2012b).

MRI scientists participated in genetic collaborative work on stock structure issues relevant to management (Tidemann *et al.* 2012, Jackson and Pampoulie 2012, Analyses of stock structure of North Atlantic fin whales continued in 2012 (Elvarsson 2012, Víkingsson *et al.* 2012, Gunnlaugsson 2012, Gunnlaugsson *et al.* 2012a).

A new method for age estimation in fin whales was presented in 2012 (Nielsen *et al.* 2012)

Anatomical studies of fin whales landed at the Hvalfjörður whaling station have led to the discovery of a new sensory organ that coordinates feeding in rorquals. (Pyenson *et al.* 2012).

Results from recent studies on pollutant levels in marine mammals from Icelandic waters and elsewhere in the North Atlantic were presented in 2012 (Huber *et al.* 2012, Auðunsson and Víkingsson 2012, Rotander *et al.* 2012a, 2012b, 2012c)

Preliminary results from two studies on the effects of whale watching on the behaviour and energetics of minke whales in Iceland is were presented in 2012 (Christiansen 2012, Martin 2012).

Results from an ongoing study on the persistence of Lamprey marks on killer whales were published (Samarra 2012).

Research on bisonar, diving and movements of white beaked dolphins in Icelandic waters was published in 2012 (Rasmussen 2012).

### **3. ONGOING (CURRENT) RESEARCH**

#### **Pinnipeds**

The ISC has applied for funds for an aerial survey of harbour seals in 2013. Harbour seal abundance surveys have been conducted more or less regularly since 1980. The last survey was in 2011.

Grey seal abundance surveys, has been planned in the autumn of 2014, and will be carried out if funds become available.

The comprehensive seal count in Húnaflói bay is conducted annually at the end of July by the ISC (since 2007).

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, was initiated in 2009. The project will be continuing in 2013 and 2014. Feeding analyses built on stable isotopes and hard-part analysis will be finished. Telemetry data from radio-tagged seals in the river mouth area of Bjargós/Sigriðastaðarós at Vatnesnes peninsula will be analyses.

A study on the effect of tourism on the spatial and behavioural haul-out patterns of harbour seals was initiated in 2008. Both the effect of land-based and boat based seal watching is being investigated. Data is at the moment being analysed and will be published in scientific papers. The study is part of the international project The wild north ([www.thewildnorth.org](http://www.thewildnorth.org)), with partners from Iceland, Norway, The Faroe Island, Greenland and Scotland. The aim of the project is to increase the possibilities of using wildlife as a resource, while at the same time minimising the negative effect that wildlife tourism may have on wild animals and nature. In 2012, a site specific code of conduct for Vatnsnes peninsula (and seal watching) was developed built on the research.

A field trips to grey seals' breeding sites on Strandir, NW-Iceland and in Breiðafjörður, W-Iceland, for staging and following the development of pups in size and moulting as they grow, are planned in autumn of 2013 by the ISC.

An investigation on the timing of birth among harbour seals in the north western part of Iceland is ongoing at the moment at the ISC. In addition, data of abundance and haulout patterns of harbour seals at Vatnsnes peninsula is being analysed at the ISC. Monitoring was regularly done in the area between 2008 and 2011.

#### **Cetaceans**

During 18-23. February 2013 the Scientific Committee of the IWC held a special workshop to review the Icelandic Special Permit Research Program on common minke whales. At the workshop 30 scientific papers from the research program were presented to a specialist panel (<https://events.iwc.int/index.php/workshops/ISPEPR2013/schedConf/presentations>). The papers covered the multiple objectives of the study, including feeding ecology (stomach contents, stable isotope ration, fatty acid profiles), energetics, multi-species modelling, biological parameters, satellite tagging, distribution and abundance, genetics, pollution, parasites and pathology. The report from the workshop /SC/20/10) and a response paper (SC/20/11) was discussed at IWC 65a and the diverse results from the program were discussed in the relevant sub-committees of the IWC.

The MRI conducted routine sampling (age, reproduction, genetics, diet, energetics) and measurements of every landed fin whale in the whaling station in Hvalfjörður. In addition scientists from several Icelandic and foreign research institutes performed sampling of the landed fin whales. Sampling from the commercial catch of common minke whales was conducted at sea by the whalers.

In 2012 skin samples for genetic analysis was collected from all marine mammals bycaught in fisheries surveys.

In 2012 the MRI submitted a comprehensive research program 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, discussion of the program was postponed to 2014.

#### **4. ADVICE GIVEN AND MANAGEMENT MEASURES TAKEN**

##### **Pinnipeds**

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 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, although recent hunt rates are much reduced. The MRI therefore reiterated the importance of better by-catch recording and that the stock was monitored, including 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. 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 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. 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 2014, 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.

#### **5. PUBLICATIONS AND DOCUMENTS (2012)**

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- Víkingsson, G.A., Gunnlaugsson, Th. and Halldórsson, S.D. 2012. National progress report on marine mammals in 2011 Paper NAMMCO-21-NPR-Iceland. 14 pp.

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- Bertulli, C.G., Bárðarson, H., Rasmussen, M.H. and Tetley, M.J. 2012. Photo-identification of minke whales (*Balaenoptera acutorostrata*) in the coastal waters of Faxaflói and Skjálfandi Bays, Iceland. ECS conference, Galway, Ireland.
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- Iversen, M., Rasmussen, M. H., Magnúsdóttir, E. E. and Lammers, M.O. 2012. Why recordings with two different methods are important in a previously non-researched area for description of marine mammal sound properties and continues monitoring: A case study of blue whale recordings in Icelandic waters. The ninth annual symposium for the Danish Marine Mammal Society, Kerteminde, DK .
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- Samarra, F. I. P., Fennell, A., Víkingsson, G. A., Pétursson, H., Sigurjónsson, J., Foote, A., Deecke, V. B. and Miller, P. J. O. 2012. Movements of individually identified killer whales (*Orcinus orca*) in Icelandic waters. European Cetacean Society (ECS) Annual Conference Galway, Ireland, 2012.
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**CATCH DATA****Cetaceans**

A total of 52 common minke whales (38 males, 11 females and 3 struck and lost) were taken as commercial catch in coastal Icelandic waters in 2012. No fin whales were taken as commercial catch in 2012.

**Seals**

Direct catches of pinnipeds in Icelandic waters in 2012. 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 | 104         | 89   | 193   |
| Grey seal        | Coastal Iceland | 85          | 88   | 173   |
| Unspecified seal | Coastal Iceland | 63          |      | 63    |

As in recent years, Icelandic authorities issued permits to Norwegian sealers to take harp seals within the Icelandic EEZ in 2012. These catches are not included here, but appear in the Norwegian sealing statistics.

**BY-CATCH DATA**

In 2012 information on marine mammal bycatch was obtained from all research surveys, inspectors in the Fishery Directorate's observer programme and handwritten logbooks kept by most of the commercial lumpfish fishery. Finally, information on bycatch events are received on occasional basis from anecdotal sources, skin trading reports and lists of samples collected by various research groups. Electronic logbook records kept by the rest of the fleet have not been received by the MRI. An overview of the situation was given by Ólafsdóttir (2010). Monitoring bycatch of pinnipeds is now the responsibility of the ISC where preparations are being made to improve the reporting. Inspectors have not reported bycatch separately except when measurements were taken. They have now been instructed to report all observed bycatch separately.

In 2010, 340 boats reported lumpfish net fishing in 8,334 trips. In 2011 298 boats reporting 5,230 trips and some bycatch of mammals or birds was reported by 42 boats. Many of the 29 boats that report only marine mammal bycatch probably did not bother to record bird bycatch, while boats that report birds likely report all bycatch. Only one boat reports birds only. In 2012 lumpfish records increased again to 332 boats in 6542 trips, though not to the 2010 level. 45 boats reported some bycatch in 289 trips (4.8%). Birds only are reported by 6 boats, implying that a part of the fleet does not have any mammal bycatch. Only 19 boats report mammals only. The reporting level is slightly lower than in 2011, but apparently there has been increased awareness of reporting bird bycatch by those that do report bycatch. Inspectors were onboard 60 lumpfish boats in 113 trips (1.8%). While inspectors were onboard 51 of these boats 7 boats report some by-catch or in 14 out of 92 trips (15%). Of the 9 instances where inspectors report marine mammal bycatch only 3 are found in the logs from fishermen, where in one case only one animal of two. A scientist from MRI was on board about 40 trips and recorded incidentally observed by-caught porpoises and recorded 2 and one of these is likely in the log from the fisherman (with a date mismatch).

Reported pinniped by-catch in 2012. Seals reported by inspectors (2 harbour and 2 grey) are also given under log books. Where pups are known they are given separately.



| Species          | Area            | Count | Pups | Gear           | Source     |
|------------------|-----------------|-------|------|----------------|------------|
| Harbour seal     | Coastal Iceland | 4     |      | Gillnet        | MRI survey |
| Harp seal        | Coastal Iceland | 3     |      | Gillnet        | MRI survey |
| Harbour seal     | Coastal Iceland | 6     |      | Lumpsucker net | Inspector  |
| Grey seal        | Coastal Iceland | 4     |      | Lumpsucker net | Inspector  |
| Harbour seal     | Coastal Iceland | 1     |      | Lumpsucker net | Biopol     |
| Gray seal        | Coastal Iceland | 1     |      | Lumpsucker net | Biopol     |
| Harp seal        | Coastal Iceland | 2     |      | Lumpsucker net | Biopol     |
| Harbour seal     | Coastal Iceland | 36    | 11   | Lumpsucker net | Log books  |
| Grey seal        | Coastal Iceland | 26    |      | Lumpsucker net | Log books  |
| Harp seal        | Coastal Iceland | 1     |      | Lumpsucker net | Log books  |
| Unspecified seal | Coastal Iceland | 112   |      | Lumpsucker net | Log books  |

Reported by-catch of cetaceans by the Icelandic fishing fleet in 2010 to 2012.

|                     |                 |     |                |               |
|---------------------|-----------------|-----|----------------|---------------|
| 2010                |                 |     |                |               |
| Harbour porpoise    | Coastal Iceland | 50  | Gillnet        | MRI survey    |
| Harbour porpoise    | Coastal Iceland | 4   | Gillnet        | MRI survey    |
| Harbour porpoise    | Coastal Iceland | 1   | Lumpsucker net | MRI scientist |
| Harbour porpoise    | Coastal Iceland | 4   | Lumpsucker net | Inspectors    |
| Harbour porpoise    | Coastal Iceland | 65  | Lumpsucker net | Log books     |
| Unspecified dolphin | Coastal Iceland | 3   | Gillnet        | MRI survey    |
| 2011                |                 |     |                |               |
| Harbour porpoise    | Coastal Iceland | 28  | Gillnet        | MRI survey    |
| Harbour porpoise    | Coastal Iceland | 6   | Gillnet        | Inspectors    |
| Harbour porpoise    | Coastal Iceland | 1   | Anglerfish net | Inspectors    |
| Harbour porpoise    | Coastal Iceland | 149 | Lumpsucker net | Log books     |
| Unspecified dolphin | Coastal Iceland | 3   | Lumpsucker net | Inspectors    |
| 2012                |                 |     |                |               |
| Harbour porpoise    | Coastal Iceland | 28  | Gillnet        | MRI survey    |
| Harbour porpoise    | Coastal Iceland | 1   | Lumpsucker net | Inspectors    |
| Harbour porpoise    | Coastal Iceland | 1   | Lumpsucker net | MRI scientist |
| Harbour porpoise    | Coastal Iceland | 113 | Lumpsucker net | Log books     |
| Unspecified dolphin | Coastal Iceland | 1   | Lumpsucker net | Log books     |

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#### 4.4

### NORWAY - PROGRESS REPORT ON MARINE MAMMALS 2012

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## 1. INTRODUCTION

This report summarises the Norwegian research on pinnipeds and cetaceans conducted in 2012. The research was conducted at, or by representatives and associated groups of the

Institute of Marine Research (IMR),  
Norwegian Polar Institute (NP),  
University of Oslo/Natural History Museum (NHM),  
Laboratory for Environmental Toxicology, the Norwegian School of Veterinary Science/National Veterinary Institute (NVH/VI),  
Norwegian Defence Research Establishment (FFI),  
University of Tromsø (UIT),  
University of Tromsø/ Department of Arctic and Marine Biology (UIT-AMB),  
Norwegian School of Veterinary Science/ Section of Arctic Veterinary Medicine (NVH-SAV).

## 2. RESEARCH 2012

### 2.1 Species/Stocks studied

#### Pinnipeds

- Harp seals *Phoca groenlandica* - Greenland and Barents Seas
- Hooded seals *Cystophora cristata* - Greenland Sea
- Harbour seals *Phoca vitulina* - Norwegian coastal waters
- Grey seals *Halichoerus grypus* – Norwegian coastal waters
- Ringed seal *Phoca hispida* – Svalbard
- Bearded seal *Erignathus barbatus* – Svalbard
- Walrus *Odobenus rosmarus* – Svalbard and Pechora Sea
- Ross seals *Ommatophoca rossii* – Weddell Sea, Antarctica
- Antarctic fur seal *Arctocephalus gazella* – Bird and Bouvet Island, Antarctica
- Crabeater seals *Lobodon carcinophagus* – Weddell Sea, Antarctica
- Southern elephant seals *Mirounga leonine* – Bouvetøya
- Weddell seals *Leptonychotes weddellii* – Weddell Sea, Antarctica

#### Cetaceans

- Minke whales *Balaenoptera acutorostrata* - Northeast Atlantic
- Fin whale *Balaenoptera physalus* – North Atlantic
- Humpback whale *Megaptera novaeangliae* – North Atlantic
- Sei whale *Balaenoptera borealis* – North Atlantic
- Bowhead whales *Balaena mysticetus* – North Atlantic
- Beluga whale *Delphinapterus leucas* – Svalbard
- Narwhal *Monodon monoceras* – North Atlantic
- Killer whales *Orcinus orca* – North Atlantic
- Sperm whales *Physeter macrocephalus* – North Atlantic
- Long-finned pilot whales *Globicephala melas* – North Atlantic
- Harbour porpoise *Phocoena phocoena* – West Greenland, Maniitsoq, North Atlantic.

## 2.2 Field Work

### Pinnipeds

It is recommended that comprehensive aerial surveys needed to provide estimates of current pup production should be conducted periodically (*ca* every 5 year), and that efforts should be made to ensure comparability of survey results. Most recent abundance estimate for **harp and hooded seals** in the Greenland Sea were from 2007. For this reason, new surveys were carried out in March-April 2012 using an icegoing vessel (*‘Nordsyssel’*), one helicopter and two fixed-wing aircrafts. Both **hooded** and **harp seal** pup production was surveyed. (IMR)

Abundance estimation using aerial photographic surveys was performed for **harbour seals** in mid and northern Norway in August 2012 (i.e., the moulting period, methodology based on total counts). (IMR)

Ecological studies of **harbour and grey seals** were carried out in Finnmark, North Norway, in September. (IMR)

Dedicated surveys designed to obtain biopsy samples from **harbour seal** pups were carried out in mid and northern Norway, in June. The samples will be used in genetic studies aimed to assess stock structure. (IMR)

Material to assess demographic parameters (teeth, measurements) and population structures (tissues for genetic analyses) were collected from the Norwegian **grey** and **harbour seal** hunt. (IMR)

Flushing of lungs of dead seals (post mortem bronchoalveolar lavage) to collect cells (macrophages) were conducted on 5 **hooded seals** euthanized due to other research purposes at the animal research facilities at Department of Arctic and Marine Biology. (NVH-SAV and UIT-AMB)

Studies of **hooded seals** and **harp seals** from the Greenland Sea stock were conducted during a research cruise with R/V “Helmer Hanssen” in the Greenland Sea between 19 March and 4 April 2012. Four adult female and 8 newborn hooded seals were culled for collection of brain tissue samples, for continued studies of the mechanisms underlying neuronal tolerance to lack of oxygen (hypoxia) and exposure to reactive oxygen species (ROS) in diving mammals (collaboration with Dr. T. Burmester and Dr. N Czech-Damal, Zoologisches Institut und Museum, Universität Hamburg, Germany). In addition, samples and data were collected for other scientific projects at other Norwegian institutes that report separately. (UIT-AMB)

Eight 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 mechanisms for maintenance of body water homeostasis in this species. (UIT-AMB)

The described field research was combined with teaching of 17 students that participated on the cruise, which represents a mandatory part of the course “Arctic Biology” (BIO-2310) at the University of Tromsø. (UIT-AMB)

**Ringed seals** (N=10) were equipped with satellite tags that measure oceanographic data and report GPS positions via the Argos system. In addition 8 other **ringed seals** were equipped with satellite tags that measure oceanographic data, but only gives positions based on Argos calculations. (NP)

Two adult **bearded seals** were equipped with satellite tags that measure oceanographic data and report GPS positions via the Argos system in a new study of space use by adult individuals of this species. (NP)

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. An aerial survey of the walrus population in Svalbard was conducted in August 2012. (NP)

Research vessels, coastguard vessels and other providers have collected incidental observations of marine mammals. Recorded data include date, position, species and numbers. During 2012, 71 pinniped

observations were recorded. Of these, 8 observations were of **harp seal** groups, 5 **bearded seals**, and 25 **walrus** groups. (IMR)

### Cetaceans

Research vessels, coastguard vessels and other providers have collected incidental observations of marine mammals. Recorded data include date, position, species and numbers. During 2012 a total of 1158 cetacean observation incidents have been reported. The most frequently observed species were **minke whales** (209 groups), **Lagenorhynchus dolphins** (218), **fin whales** (139), **humpback whales** (182), **killer whales** (138), **harbour porpoises** (52 groups), **blue whales** (7), **sperm whales** (20), **northern bottlenose whales** (22), **long-finned pilot whales** (36), **bottlenose dolphins** (3), **sei whales** (13), **common dolphins** (16 groups), **narwhal** (5) and **white whales** (6). (IMR)

During the traditional whaling season (April-October), body condition data and tissue materials for studies of DNA identity were collected from all **minke whales** taken by vessels participating in the Norwegian small type whaling. (IMR)

Biological material to establish nutritive status by analyses of stomach contents and fatty acid composition in blubber profiles, were taken from **minke whales** taken on one of the vessels participating in whaling operations in the Barents Sea and along the coast of Norway in May-June. (IMR)

One acoustic recorder (AURAL) listening for **bowhead whales** was deployed autumn 2011 and was retrieved during autumn 2012. This AURAL was redeployed in the same area in the Framstrait. In addition, a new AURAL was deployed on the continental slope north of Svalbard. (NP)

During 2012 photo IDs have been collected from about 215 **humpback whales** during field work and from incidental sources. In addition, biopsy samples have been collected from 2 **fin whales** and 15 humpback whales. (IMR)

During the period 6 August to 30 September 2012 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)

## **2.3 Laboratory work**

### Pinnipeds

Tissues sampled for stock identity studies of **harp and grey seals** have been analysed using DNA techniques. (IMR)

Demographic and reproduction data from **harp seals** taken in commercial catches, and **hooded seals** taken in dedicated surveys, are being analysed. (IMR)

Photos from aerial surveys of **harp and hooded seal** pup production (conducted in March 2012) are being analyzed. (IMR)

Stomach, intestine and faeces samples from **harp and hooded seals** are being analysed. (IMR)

Blubber profiles (fatty acids) and meat (stable isotopes) of **harp seals** taken in the commercial hunt in the southeastern Barents Sea are being analysed and compared with potential prey animals. (IMR, NP)

*Brucella pinnipedialis*: Cultured adherent cells from the bronchoalveolar lavage in **hooded seals** were by immunocytochemistry found to be positive for the monocyte/macrophage membrane marker CD14, as well as the pan-leukocytic marker CD18. They performed phagocytosis of latex beads in a functional

phagocytosis assay and based on these characteristics they were verified to be primary alveolar macrophages. (NVH-SAV)

*In vitro* infection of primary hooded seal alveolar macrophages with *B. pinnipedialis* from hooded seal has been performed. The ability of the marine *Brucella* spp to enter and multiply intracellularly in hooded seal macrophages 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. (NVH-SAV)

Phocine herpesvirus 1 (PhHV-1) infections in seals are associated with disease and sometimes high mortality, primarily in young animals. Harbour seals from Svalbard (Forlandet) was investigated for antibodies against PhHV-1 and the presence of PhHV-1-specific DNA in swab samples from eye and nose (PCR and qRT-PCR). (NVH-SAV)

Prion protein analysis: Mammalian species vary widely in their apparent susceptibility to prion diseases. Whether seals, and other carnivores, can contract prion diseases (e.g. chronic wasting disease or CWD) remains an open question. The open reading frame of the PRNP gene encoding PrP(C) protein was sequenced from brain tissue from 23 hooded seals. (NVH-SAV)

Immunohistochemical studies of expression levels and distribution of neuroglobin were conducted using previously collected brain tissue from **harp seals**, as part of ongoing collaborative studies on the tolerance to hypoxia and to reactive oxygen species in the brain of diving mammals (collaboration between Dr. T. Burmester and Dr. Nicole Czech-Damal, Zoologisches Institut und Museum, Universität Hamburg, Germany, and Prof. Lars Folkow at UIT-AMB). (UIT-AMB)

Electrophysiological studies of mechanisms underlying neuronal hypoxia tolerance in **hooded seals** were continued. (UIT-AMB)

**Hooded seal** pups are born with mature blood haemoglobin levels (*i.e.* similar to those of adults), but have much lower levels of myoglobin in their skeletal muscles, compared to adults. However, during their first weeks of living, muscle myoglobin levels increase rapidly, despite low feed intake. We have therefore looked into the iron metabolism of young animals, to investigate to what extent liver iron stores support the anabolism of myoglobin and haemoglobin in early life. (UIT-AMB)

Analyses of PCB 153 in feed and in mice, exposed to PCB-153 contaminated feed were performed in the Laboratory for Environmental Toxicology, the Norwegian School of Veterinary Science/National Veterinary Institute, Norway (NVH/VI) in connection to the research of PhD Ingebjørg H. Nymo at NVH/SAV, Tromsø, Norway, (*Brucella pinnipedialis* hooded seal (*Cystophora cristata*) strain in the mouse model following exposure to PCB 153). Results described in 2.5 (result research). (NVH-VI)

### Cetaceans

Blubber profiles (fatty acids) and meat (stable isotopes) of **minke whales** taken in thre commercial hunt in the southeastern Barents Sea are being analysed and compared with potential prey animals. (IMR, NPI)

Tissues sampled for stock identity studies of **minke whales** have been archived and analysed using DNA techniques. (IMR)

A direct agglutination test kit (Toxo-Screen DA bioMerieux S.A., Marcy-l'Etoile, France) has been used to evaluate the presence of anti-*Toxoplasma gondii* (parasite) antibodies in 20 harbour porpoises (*Phocoena phocoena*) from West Greenland. (NVH-SAV)

Immunohistochemical studies of expression levels and distribution of neuroglobin were conducted using previously collected brain tissue from **minke whales**, as part of ongoing collaborative studies on the tolerance to hypoxia and to reactive oxygen species in the brain of diving mammals (collaboration between

Dr. T. Burmester and Dr. Nicole Czech-Damal, Zoologisches Institut und Museum, Universität Hamburg, Germany, and Prof. Lars Folkow at UIT-AMB). (UIT-AMB)

Biopsy samples of **bowhead whales** from western Greenland are continued to be analyzed using DNA techniques for analyses of population structure and size. A master thesis on the subject was finished. (GINR, UWash., NHM)

Biopsy samples from **beluga whales** from Svalbard are being analysed using DNA techniques in order to study population structure. A master thesis on the subject was finished. (NP, NHM)

Data from passive acoustic recorders attached to NP and AWI moorings in the Fram Strait during the period September 2008-September 2009 have been analysed. Results were published in 2012. The study continues. (UWash., NOAA, AWI, NP, NHM)

Samples from **minke whale**, **fin whale** and **sei whale** have been analysed for the presence of anti-*Brucella* antibodies using an iELISA. (NVH-SAV)

Databases containing incidental observations of marine mammals have been updated. Minke whale catch data for the 2012 season have been computerised and evaluated. The work with cataloguing identification photos of humpback whales collected on incidental occasions and during our own surveys in Norwegian and adjacent waters are continuing. (IMR)

## 2.4 Other studies

Nothing to report.

## 2.5 Research results

### Pinnipeds

**Harp seals** are major top predators in the Barents Sea. During spring they whelp and moult in the White and southeastern Barents Sea. In June they disperse to feed, following the receding ice edge and moving northwards in the Barents Sea. Studies of their foraging behaviour during this intensive summer feeding period were conducted in the northern Barents Sea in 1996-2006. Subadult (<150 cm) and adult seals were observed to feed heavily on pelagic crustaceans (particularly krill) – adult seals also ate fish. In terms of biomass, krill was most important (63%) followed by polar cod (16%) and other fish species (10%). The seals targetted primarily the most lipid-rich prey at this time of the year: krill, followed by other crustaceans and polar cod. Other fish species were very lean. Availability of high-energetic food in the northern areas in spring and summer presumably provide the energetic advantage necessary to account for the long migrations of harp seals from their more southerly located winter distributions. (IMR)

In the Barents Sea the ice coverage is at its minimum in summer and autumn. In recent years, the ice free area of the northern part of the Barents Sea has increased during summer. Additionally, some fish species, such as cod, have extended their range northwards. Could these observed changes in habitat have affected the possibilities for **harp seals** to restore their blubber reserves during summer feeding? Harp seal body condition, estimated from samples taken during spring in 1992-2011, exhibited a slow increase from 1992 to 2001, whereafter a significant decrease to a minimum in 2011 occurred. Analyses of relevant covariates indicated that high abundance of krill impacted the seal condition positively, emphasizing the ecological significance of krill as key food for harp seals during summer. High abundances of capelin, polar cod and cod had, however, a negative impact on seal condition. A linear correlation between annual pup production and blubber thickness indicated that recently observed declines in pup production may be associated with changes in body condition of the seals. Seemingly, indirect effects such as competition between harp seals and prey for shared resources such as krill, may have resulted in negative effects on condition with subsequent implications for breeding success. Longer migration routes with increased energy expenditure between the breeding/moulting areas and feeding areas along the ice edge may certainly also have contributed to the reduced recent harp seal body condition. (IMR)

Historical Norwegian and Russian data which describe the trends in fertility rate and maturity at average age (MAM) for **hooded seals** in the Greenland Sea have recently been subjected to joint analyses. Based on new 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. The most recent estimate of MAM(P) is based on samples collected in July and it is likely that the low estimate of MAM(P) is due to late ovulations in nulliparous females. A similar pattern has been found for Northwest Atlantic hooded seals, which also indicate that these late ovulations do not appear to result in successful pregnancies. Therefore, parity curves may be more appropriate for modeling of hooded seal population dynamics than maturity curves. (IMR)

**Grey seal** pup production was surveyed along the Norwegian coast in 2006-2008 and resulted in a total minimum estimate of about 1270 grey seal pups. An age-structured population dynamics model for the Norwegian grey seal population has been developed. The model, which uses pup production as an important input parameter, is of a Bayesian character in the sense that priors for various parameters were used. Model runs indicated an increase in the abundance of the total Norwegian grey seal population during the last 30 years, suggesting a total of 8740 (95% confidence interval: 7320–10 170) animals in 2011. A total catch of 707 (95% confidence interval: 532–882) grey seals would maintain the population size at the 2011 level. Model runs suggest that current catch levels will likely result in a reduction in the population size in Sør-Trøndelag and Nord-Trøndelag counties, and an increase in the population size in Rogaland, Nordland, Troms, and Finnmark counties. The model runs assumed that 80% of the seals taken in Rogaland came from the UK and that 50 and 55% of the catches in Troms and Finnmark, respectively, were immigrants from Russia. (IMR)

Error patterns in age estimation and tooth readability assignment of **grey seals** has been evaluated in a transatlantic, image-based, blind-reading study using known-age animals. The experiment involved ten readers, who estimated age using images of cementum growth layers from teeth of 68 known-age seals (0-22 years). The percentages of correct estimates ranged from 32.4% to 60.3% among readers, and 89.3% of all errors were by +1-2 years. Six readers showed increasing underageing with increasing seal age. An elevated risk of underestimation by 1 year occurred in teeth collected 0-5 months after breeding and was attributed to more frequent absence of a distinct growth layer for the new year and lack of information on months between the last birthday and the date of sample collection (plusmonths). For plusmonths 6-11, positive bias was predominant, suggesting that overestimation is the more common error when plusmonth information is available. Readers assigned readability scores to the tooth sections, and 79.1% of all ageing errors occurred in sections of low or intermediate readability. Excluding these sections would, however, also exclude 43.0% of all correct estimates. Neither levels of age estimation error nor predictive values of readability assignments were associated with reader experience levels. Analyses of image markings identified common errors in delineations of annual increment layers.

**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 ( $\pm 2$  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, in coastal Norwegian waters. 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 have both contributed to the observed population decline. New boat based counting surveys were carried out in parts of Finnmark in 2009, continued in Sognefjorden, Lysefjorden and along the western Skagerrak coast in 2010. In 2011, aerial photographic surveys were carried out along the southwest Norwegian



coast and in Vestfold county. Results from the surveys show 248, 481, 538 and 689 harbour seals in the counties Vestfold, Rogaland, Sogn og Fjordane and Møre og Romsdal, respectively. These results are ranging between 64% and 94% of the population sizes counted in the period 1996-1999. In 2012, aerial photographic surveys were carried out along the mid and northern Norwegian coast. Photo analyses are in progress and results will be available during 2013. (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**. In September-October 2009 and 2010, 12 harbour seals (6 each year) were equipped with GPS phone tags and data on their movement and diving behaviour sampled for about 10 months. Harbour seal scat samples were collected in autumn 2009 and 2010. After otolith analysis, harbour seal diet in the area has been estimated to be composed mainly of Gadidae and Cottidae, with a smaller fraction of pelagic fish such as herring. Preliminary 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 very few registered trips to the outer areas. However the tagging of three individuals respectively in 2011 and 2012, in addition to on site observations, has shown a very different picture from the trends of the first two years. These individuals have undertaken much longer trips to the outer parts of the fjord, and observations have reported a much smaller number of animals in the inner parts of the fjord, indicating a change in habitat from the previous period. (IMR, UIT)

The *in vitro* assays showed that two different *B. pinnipedialis* strains and one *B. ceti* strain were able to enter primary **hooded seal** alveolar macrophages *in vitro*. None of the strains multiplied intracellularly and all were eliminated by 48 h p.i. These results suggest that the *B. pinnipedialis* hooded seal strain is not able to multiply and induce a chronic infection in hooded seal macrophages. The fact that *B. pinnipedialis* reference strain and *B. ceti* were eliminated shortly after entry into the hooded seal alveolar macrophages could reflect host specificity rather than lack of ability to multiply intracellularly in preferential host specific macrophages. (NVH-SAV)

A species-independent iELISA based on chimeric protein A/G has been established and compared to multiple other serological tests for hooded seals (*Cystophora cristata*), minke whales (*Balaenoptera acutorostrata*), sei whales (*Balaenoptera borealis*), fin whales (*Balaenoptera physalus*) and polar bears (*Ursus maritimus*). The protein A/G iELISA results were shown to be consistent with other serological tests, and the protein A/G iELISA can thus offer a technically simple method for these species yielding results consistent with established brucellosis serological tests. The binding of the antibodies from the respective species to protein A and G were also evaluated in the iELISA. The validated iELISA was thereafter utilized to perform a serological investigation of the *Brucella*-status in the reduced Northeast Atlantic stock of hooded seal. No relationship was observed between *Brucella*-serostatus and body condition or reproductive traits. Pups had a substantially lower probability of being seropositive than yearlings, suggesting that exposure may occur early in life. For seals over one year, the mean probability of being seropositive decreased with age, with no seropositives in animals older than five years of age, indicating loss of antibody titre with chronicity or clearance of infection. Organ samples from 21 hooded seals were investigated for the presence of *Brucella pinnipedialis* by bacteriology, and *B. pinnipedialis* was isolated from one animal. (NVH-SAV)

Phocine herpesvirus 1 (PhHV-1) DNA was detected in samples from 6 (8%) seals collected in 2009 and 2 (3%) in 2010; all had herpesvirus DNA in the ocular swab sample, whereas only one of these animals also had herpesvirus DNA in the nasal swab sample. Serum samples obtained in 1998 (n=59), 1999 (n=74), 2000 (n=81), 2009 (n=69) and 2010 (n=83) were tested for anti-PhHV-1 antibodies in an indirect ELISA. The PhHV-1 seroprevalence in the population remained high throughout this period, varying from 77 to 100% between years. No eye disease was observed in this harbor seal population, but the ELISA and PCR findings reported here suggest that PhHV-1 is endemic in this globally

northernmost harbour seal colony, and that the virus is shed on the mucosa of the eye and nose. The impact of this infection on the individual level and on the population level is, however, not known. (NVH-SAV)

Prion protein analysis: All animals from hooded seals, as well as other species of wild carnivores analyzed, showed a very limited variation of their PrP<sup>C</sup> sequences, and three amino acid dimorphisms were found in hooded seals, generally indicating little susceptibility to TSE-diseases. However, these results were based on a limited number of individuals. (NVH-SAV)

Previous studies in **hooded seals** have revealed that their cerebral neuroglobin levels are not higher than those of rodents or man. Instead, the protein has an unusual cellular distribution, with higher detection levels in glial cells (astrocytes) than in neurons. This distribution, which contrasts with that of terrestrial mammals, has now been confirmed in **harp seals** (Schneuer et al., 2012). Since neuroglobin has repeatedly been shown to be closely associated with mitochondria, thereby implying a key role in oxidative metabolism, these findings further support the idea that glial cells are more involved in aerobic metabolism than are neurons, in the seal brain. (Universität Hamburg, UIT-AMB)

We have previously reported that the fairly low levels of myoglobin that are found in the skeletal muscles of neonate **hooded seals** display a fairly rapid increase during the first few weeks of living, and then level off before a new, slower increase is seen. We have found that their liver iron content shows a marked drop in the same period, implying that hepatic iron stores are mobilized to support the observed early development of myoglobin (Geiseler *et al.* 2012). (UIT-AMB)

Previously collected data for a range of Antarctic pinnipeds have been analysed and compiled into two publications (Tryland et al. 2012, Southwell et al. 2012). (SAV/NVH, DFO-Canada, NPI, Freie Universität Berlin, IMR, UIT-AMB; Australian Antarctic Division, NMML/NOAA Fisheries, University of Pretoria, Alfred Wegener Institute, BAS, University of New South Wales, Hubbs-Sea World Research Institute, UIT-AMB)

*Brucella pinnipedialis* hooded seal (*Cystophora cristata*) strain in the mouse model following exposure to PCB 153 (PhD Ingebjørg H. Nymo): Female BALB/c mice (n=80) were housed in cages in a negative pressure plastic film isolator in a BSL-3 facility at the Norwegian Veterinary Institute in Oslo, Norway. Half of the mice were exposed to PCB 153 in the food; 4.08 µg/g food. The mice were infected with *B. pinnipedialis* hooded seal strain or *Brucella suis* 1330 (positive control). PCB 153 did not alter the outcome of an experimental infection in BALB/c mice with *B. pinnipedialis* hooded seal strain or *B. suis* 1330. There was in general a lower immunological response to *B. pinnipedialis* than to the positive control strain *B. suis* implying a lower pathogenic potential of *B. pinnipedialis* in the mouse model. See also presentations on this issue. (NVH-VI)

### Cetaceans

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 was studied in 28 minke whales taken in the 2010 hunt off Vesterålen and in the Svalbard area. The fatty acid composition was determined in the inner and outer sections of the whale blubber – these two sections differed considerably. Fatty acid composition in the inner blubber (assumed to be the most active metabolically) differed between hunting areas (Vesterålen and Svalbard) and between whales with different stomach contents. When fatty acid composition in whale blubber was compared with potential prey species, considerable differences were found. Analyses are still in progress. New samples from minke whales were collected in 2011 – analyses are in progress. (IMR, UIT)

The Norwegian **minke whale** DNA register is a data base monitoring commercial harvest and trade of whale products. The register's logistics and specifications have now been reviewed, and the potential to apply similar registers to control the exploitation of other marine species has been evaluated. The register has also been used in a number of ad hoc scientific studies resulting through the accumulation of genetic, demographic and biological data. (IMR)

*Toxoplasma gondii*: The 20 harbour porpoises (*Phocoena phocoena*) from West Greenland investigated for antibodies against the parasite *Toxoplasma gondii* were all seronegative (no antibodies detected). (NVH-SAV)

In contrast to pinnipeds, **minke whales** have recently been shown to have a typical mammalian cerebral distribution of neuroglobin, with higher levels in neurons than in astrocytes, but their neuroglobin mRNA expression levels are 4-15X higher than in the seal brain (Schneuer et al., 2012). This finding is consistent with a possible role for neuroglobin in facilitated diffusion and local storage of O<sub>2</sub> within whale neurons. It, thus, appears that neuroglobin may convey brain hypoxia tolerance in both seals and whales, but that its role is quite different in the two orders. (Universität Hamburg, UIT-AMB)

### 3. ONGOING (CURRENT) RESEARCH

IMR conducted aerial surveys to assess pup production for populations of both **hooded** and **harp seals** in the Greenland Sea in 2012. Analyses of the data collected are in progress.

Analyses of **hooded seal** reproduction data (historical as well as new, sampled in 2008 and 2010) from the Greenland Sea are in progress, some of the results were recently submitted. (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)

Final analyses of **grey seal** diet data from the Norwegian coast are in progress, an article will be submitted shortly. (IMR)

Genetic and population studies of **harbour** and **grey seals** continue. (IMR)

Aerial surveys aimed to obtain a new abundance estimate for **harbor seal** in Norway, were conducted in August 2012, area of operation was the mid and northern coast of Norway. Work with counting of seals on photos are in progress. (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)

A study on haul out behaviour was carried out in the summer and autumn of 2012, to compare the **harbour seals** population's haul out patterns in three different fjords in Finnmark (Porsangerfjord, Tanafjord and Kongsfjord). The results of this comparison (still under analyses) will be used to refine annual population estimates made by aerial photography of the hauled out harbour seals colonies. Moreover, the haul out data collected in Porsangerfjord will be used to understand how the individual behaviours, registered through the deployed tags, sum up to a collective general pattern at the population level. (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 - NP)

Various aspects of **minke whale** genetics, using data from the Norwegian DNA register, are being studied in work in progress. (IMR)

If funding is allocated (from the Norwegian Ministry of Fisheries) ship based registrations of **grey seal** pups, including tagging, counting and staging of pups, will be conducted in Troms and Finnmark during the period September-November 2013. This is the first 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)

Present studies aim to provide knowledge of the infective capacity of the marine mammal brucellae measured by the ability to invade and replicate in professional phagocytes and epithelial cells *in vitro*. Special emphasis is devoted to *Brucella pinnipedialis* strain isolated from **hooded seal** previously shown not to multiply in hooded seal alveolar macrophages culture. The infective capacity of *B. pinnipedialis* hooded seal strain will be tested in different primary cell tissue cultures from the hooded seal. Since 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, macrophages from fish will be introduced to the *Brucella*-infection assays. Emphasis is also paid toward examining the intracellular mechanisms involved in the survival or destruction of the invading brucellae (NVH-SAV).

A serological test (virus neutralization test; VNT) for detection of antibodies against different morbilliviruses, causing epizootics among harbor and grey seals, dolphins and many other marine mammal species, are being established at NVH-SAV. The system consists of a modified cell type in culture (Vero DogSlamTag with enhanced virus receptors) and phocine distemper virus, canine distemper virus and dolphin morbillivirus, to distinguish the antibody response and indicate to which virus the animal was exposed. The test will be used on harbor seals (Svalbard) and also other marine mammal species. (NHV-SAV)

Studies of neuronal hypoxia tolerance in diving mammals, of the development of oxygen storing capacity in newborn **hooded seals**, and of maintenance of water homeostasis in **hooded seals** are continued. (UIT-AMB)

### Cetaceans

A series of behavioural response studies of cetaceans to naval sonar signals have been conducted in Norwegian waters. The overall goal of this international cooperative research program is to investigate behavioral reactions and the sound exposures required to elicit them of three species of whales: **bottlenose whales**, **minke whales**, and **humpback whales** to Low Frequency Active Sonar (LFAS) signals. The results will be interpreted to generate dose-response functions, in order to help establish safety limits for sonar operations for these species. Another primary goal of the program is to experimentally assess the effectiveness of “ramp-up,” a common mitigation protocol in which source levels are gradually increased prior to the onset of full-level transmissions. Ramp-up is designed to give nearby animals some time to move away before sonar transmissions reach maximum levels. However, it is unknown whether or not this protocol is actually effective for animals in their natural environment. We have developed and implemented an experimental design to test whether the ‘ramp-up’ procedure is an effective protocol to reduce risk of harm from sonar activities (FFI).

We presented sonar signals (1-2 kHz) and control sounds, to cetaceans while observing their behavior using Dtags, towed hydrophones, and visual observations. Each tagged animal was observed visually and acoustically from an observation vessel. Sonar exposure sessions started with a ramp-up to maximum source levels of 214 dB. The source vessel approached the position of the tagged whale at 8 knots while transmitting at a 20s duty cycle. The source level ramp-up and vessel approach achieved an escalation of the sonar dose throughout each exposure session. Each subject was exposed to multiple approaches (FFI).

In the second research cruise of the current project, we operated in the same research area off Spitsbergen that we successfully established in the 2011 research trial. The 3S-12 research cruise took place between Tromsø and Svalbard, 70°-80° northern latitude and 3°-18° eastern longitude, June 1-30, 2012 using the Norwegian military research vessel H.U. Sverdrup II (Fig. 2). On this 2nd research cruise of the project, a total of 389 sightings of an estimated 800 individual cetaceans were made. We deployed 16 Dtags, 13 to humpback whales and 3 to fin whales for a total of 172 hours of Dtag recordings. After 2 of 3 planned sonar trials, we have now conducted 10 ramp-up experiments with humpback whales, one dose-escalation experiment to a minke whale (detailed below), but no tagging and no controlled exposure experiments with Northern bottlenose whales. We will adjust our efforts in the third trial, scheduled for summer 2013, to attempt to obtain a more balanced dataset for the total effort. (FFI)

We have analyzed in detail the behavioral record obtained from a minke whale during the 2011 trial. Initial indications are that the whale began to respond to the sonar at very low received levels, potentially indicating that minke whales are highly sensitive to sonar. Additional experiments with minke whales to replicate this experiment with another animal are a high priority for this project in 2013. (FFI, in cooperation with several international institutes)

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, Palsbøll, University of Gröningen)

#### 4. ADVICE GIVEN AND MANAGEMENT MEASURES TAKEN

##### Sealing

Advice on the management of harp and hooded seals is based on deliberations in the ICES/NAFO Working Group on Harp and Hooded Seals (WGHARP). WGHARP met during 15-19 August 2011 at the British Sea Mammal Research Unit (SMRU) at the Scottish Oceanographic Institute, University of St. Andrews, Scotland, 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 2011, based on the 2011 WGHARP meeting, were used by the Joint Norwegian-Russian Fisheries Commission to establish management advice for 2013.

The basis for the advice was a request from Norway in September 2010 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. Modifying the model by incorporating the full range of reproductive data available, as requested by ICES in 2009, gave lower, but more realistic, population estimates and catch options than in the previous modelling. 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 modified population assessment model, the size of the **Greenland Sea harp seal** population was estimated as 649,570 (95% C.I. 379,031 – 920,101) animals in 2011. 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 23% over the 10 years period 2011-2021, whereas a catch of 16,737 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 25,000 1+ animals, or an equivalent number of pups (where one 1+ seal is balanced by 2 pups), in 2012 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, isappearance/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.

Although the modified population model used for the White Sea/Barents Sea harp seal population provided a poor fit to the pup production survey data, it was assumed by ICES to provide a reasonable future prediction, and estimated the current total size of the population to be 1,364,700 (95% C.I. 1,230,384 – 1,498,916) seals. Based on current data availability, the Barents Sea / White Sea harp seal population is considered to be data rich, and above the  $N_{70}$  level by ICES. Thus, it is appropriate to provide catch advice using the modified assessment model and to apply the Precautionary harvest strategy. Current catch level will likely result in an increase in population size of 11% over the 10 years period 2011-2021, whereas a catch of 15,827 1+ animals, or an equivalent number of pups (where one 1+ seal is balanced by 2 pups), per year would sustain the 1+ 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 25,000 1+ animals, or an equivalent number of pups (where one 1+ seal is balanced by 2 pups), in 2012 and subsequent years.

Results from the most recent (2007) pup survey suggest that current hooded seal pup production remains low, and significant lower than observed in a comparable 1997 survey. The historical data on pregnancy rates that are available for this population are unreliable. Hence, the population model was run for a range of pregnancy rates, in addition to a run using the original model assuming constant reproduction rates. All model runs indicate a decrease in population abundance from the late 1940s and up to the early 1980s, and gave point estimates for the total population ranging between 85,000 and 106,000 animals, *i.e.*, a population currently well below the  $N_{lim}$  of 172,577 (30% of the  $N_{max}$  estimate of 575,257). 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. Restricted takes for scientific purposes should, however, be allowed.

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 2013 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 the 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), and 355 harbour seals and 64 grey seals were taken in 2012 (preliminary data by 26 November 2012).

### 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 5-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 2012 the total catch quota was set to 1,286 **minke whales**, the same as for 2011. The catching season will be from April 1 to August 31, 2012.

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## CATCH DATA

### Pinnipeds

Norwegian catches in the Greenland Sea in 2012 was taken by 2 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 2012. Only some animals were taken for scientific purposes. The 2012 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 2012. The Joint Norwegian-Russian Fisheries Commission has followed this request and allocated 7,000 seals of this TAC to Norway.

Table 1. shows the Norwegian catches of harp and hooded seals in 2012. The total quotas given were not fulfilled in any area: In the West Ice, 22% of the harp seal quota was taken. Russian sealing in 2012 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 2009-2011, 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 2012. Due to this, there were no commercial Russian harp seal catches in the White Sea in 2012, but local hunters took 9 adult seals for subsistence use. One Norwegian vessel had planned to conduct hunting in the southeastern Barents Sea in 2012, but was for various reasons unable to do this.

**Table 1.** Norwegian catches of harp and hooded seals in 2012. 1+ means one year old or older seals.

| <i>Catching area:</i> | <i>The West Ice (Greenland Sea)</i> |        |       | <i>The East Ice (White Sea)</i> |                                      |       |
|-----------------------|-------------------------------------|--------|-------|---------------------------------|--------------------------------------|-------|
| Species \ Age group   | Pups                                | 1+     | Total | Pups                            | 1+                                   | Total |
| Harp seals            | 3,740                               | 1,853  | 5,593 | 0                               | 9                                    | 9     |
| <i>TAC</i>            |                                     | 25,000 |       |                                 | 15,827(of which<br>7,000 for Norway) |       |
| Hooded seals          | 15                                  | 6      | 21    | na                              | na                                   | na    |
| <i>TAC</i>            |                                     | 0      |       |                                 | na                                   |       |

### Cetaceans

After a temporary suspension, the traditional small type Norwegian **minke whaling** was again permitted in 1993 and quotas were implemented based on the Revised Management Procedure (RMP) developed by the International Whaling Commission's (IWC) Scientific Committee. The RMP allocates catch quotas to specific management areas. There are five such management areas within the region of interest to Norwegian whalers. The present areas are a revision of the original implementation and introduced by the IWC/SC at their Implementation Review of North Atlantic minke whales conducted at the 2003 Annual Meeting and later kept at the Implementation Review made in 2008. The areas are (1) the Svalbard-Bear Island area (coded ES), (2) the eastern Barents Sea (EB), (3) the Norwegian Sea and

coastal zones off North Norway, including the Lofoten area (EW), (4) the North Sea (EN) and (5) the western Norwegian Sea-Jan Mayen area (CM).

In total, 17 vessels participated in the 2012 season of whaling and the catching period was 1 April to 31 August. Table IV.2 shows the number of minke whales taken by area in the 2012 season. The quotas are given as five-year block quotas but is not fully utilised in all areas. There are several reasons for that, including problems with processing the catches and accessing remote areas like the Jan Mayen area and the eastern Barents Sea. The present five-year quota period started in 2009 and is given as annual basic quotas of 885 animals within Medium Area E and 135 whales within the Small Area CM.

**Table 2.** Quotas and catches of minke whales in 2012 by management area as defined in RMP.

| <b>2012</b>               | <b>Management area</b> |    |     |     |         |            |
|---------------------------|------------------------|----|-----|-----|---------|------------|
| <i>Small-type whaling</i> | EB                     | EN | ES  | EW  | CM      | Total      |
| <b>Catch</b>              | 6                      | 14 | 244 | 200 | 0       | <b>464</b> |
| <b>Quota</b>              | 1016                   |    |     |     | 270     | 1286       |
| <b>Stock area</b>         | Northeastern           |    |     |     | Central |            |

Appendix 2

## BY-CATCH DATA

### Introduction

**Harbour porpoises** are caught in gillnets in the coastal fisheries. To estimate the total bycatch of harbour porpoises in fisheries for cod and angler fish along the coast, we have used data collected by contracted small vessels in the Coastal Reference Fleet (CRF) which use the same nets as the commercial coastal fleet. Estimated porpoise catch rates relative to catches of cod and angler fish in the CRF are being used to extrapolate to the entire commercial coastal fleet based on their total catches of cod and angler fish. Furthermore, detailed information from the CRF about the fishing operation allowed us to identify influential factors potentially relevant as mitigation factors. Such factors include bottom depth where nets were set, net soaking times and geographic and seasonal variation in bycatch rates. The analyses indicate very high by-catch rates of harbour porpoises. The work has been finalized and published in 2013 (Björge *et al.* 2013).

## SECTION 5 – ADDRESSES

|            |  |            |
|------------|--|------------|
| <b>5.1</b> | <b>Delegates and Observers to the Twenty Second Meeting of the Council .....</b> | <b>289</b> |
| <b>5.2</b> | <b>Council Members .....</b>   | <b>293</b> |
| <b>5.3</b> | <b>Management Committee Members .....</b>  | <b>295</b> |
| <b>5.4</b> | <b>Scientific Committee Members .....</b>  | <b>297</b> |
| <b>5.5</b> | <b>Hunting Committee Members.....</b>  | <b>299</b> |
| <b>5.6</b> | <b>NAMMCO Scientific WG on Harbour Porpoises .....</b>                           | <b>301</b> |
| <b>5.7</b> | <b>NAMMCO Scientific WG on Walruses .....</b>                                    | <b>303</b> |
| <b>5.8</b> | <b>Secretariat .....</b>   | <b>305</b> |





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