**NAMMCO SCIENTIFIC COMMITTEE**

**TRANS NORTH ATLANTIC SIGHTINGS SURVEY (TNASS)**

**FIRST PLANNING MEETING,**

**Reykjavík, 22 March 2006**

## 1. PRELIMINARY PLANS FOR 2007 BY JURISDICTION

### Canada

Preliminary plans are for an aerial survey out to the approximate limit of the continental shelf, divided into 3 sections: Arctic (northern Labrador to northern Baffin Island), Newfoundland/Labrador (northern Labrador to the southern Grand Banks), and Scotian Shelf/Gulf of St. Lawrence. At present funding is in place for the Newfoundland/Labrador survey, probable for at least part of the Arctic survey, and uncertain for the Scotian Shelf/Gulf survey. The northward extent of the Arctic survey is also uncertain and will depend to some extent on coordination with Greenland. In particular Canada is interested in working with Greenland to ensure that Baffin Bay is surveyed from coast to coast, as far north as feasible.

There are at present no plans to carry out ship surveys, however surveys will be coordinated with American ship surveys as insofar as possible. These may be uncertain because of recent budget cutbacks in the USA, although there is recent information that suggests the US will be conducting some cetacean survey activity in 2007 (perhaps with their new NOAA research vessel).

There is very little recent information on the distribution and abundance of cetaceans in Canadian waters, so all species are of interest. Harbour porpoise, blue and fin whales, and leatherback turtles are "species at risk" in Canada and therefore of highest priority.

### Greenland

Plans for Greenland are as yet very uncertain, and will depend to some extent on whether surveys carried out in 2005 are successful in producing acceptable abundance estimates for minke and fin whales. Priority species would be minke, fin, and humpback whales, and narwhal north of Melville Bay. Previous surveys have indicated that baleen whales are uncommon north of Disko Bay during the summer and fall, so this will have to be a consideration in the design and in coordination with Canada. Funding is not yet in place for any survey activities. Witting noted that he would be discussing the possibility of using Coast Guard vessels as survey platforms.

### Iceland

At present it is expected that the Icelandic coverage will be similar to that of NASS-2001. Offshore areas will be covered by ship and nearshore areas will be covered by aerial survey as in previous years. Target species will be minke and fin whales, and there will be a greater emphasis on getting viable estimates of harbour porpoises from the aerial survey.

As in 2001 the southwest area will be surveyed by combining platforms with an ongoing redfish survey. Russian and German vessels will also be involved and it may be possible to extend the coverage of the survey by putting cetacean observers on these vessels. There will also be a capelin and environmental research survey in the Greenland Sea north of Iceland in 2007, and it may be possible to co-platform with this survey as well. However this may be logistically difficult because of space limitations, frequent stops for hydrological sampling and vessel allocation issues. It is therefore likely that at least one dedicated cetacean sightings vessel will be required.

**Faroes**

At present the Faroes plans to carry out a vessel survey with coverage similar to that of 2001. The area will be designed to adjoin the CODA area if that survey takes place. Funding will be both external (from the oil industry?) and from the Faroese government. Target species will be fin whales and small whales such as pilot whales. It was noted in this respect that NASS coverage and timing has not been appropriate for obtaining a good estimate of pilot whale abundance since the 1989 survey.

**Norway**

Norway will be continuing its "mosaic" surveys in 2007, which will be the final year of a 6 year series. This means that areas that were not covered well in the previous 5 years will be re-done in 2007. Candidate areas are the area west of Svalbard, which could connect to the Icelandic sector, and the area west of Lofoten. This will depend to some extent on whether or not Russian authorities grant access to the eastern Barents Sea this year.

Methods will be the same as in previous surveys, and the target species is the minke whale. Two vessels will be used for a period of 5 weeks.

**Russian Federation**

Information on preliminary plans for surveys by the Russian Federation were received after the meeting:

- continue marine mammal aerial and research vessel surveys as part of annual mackerel feeding research in the Norwegian Sea during June-August;
- continue marine mammal aerial and research vessel surveys as part of annual joint Russian/Norwegian ecosystem surveys in the Barents Sea during August-September;
- carry out marine mammal research vessel surveys as part of International redfish research in the Irminger Sea during May-June;
- carry out marine mammal survey onboard research aircraft and vessels in the Barents Sea during special research for oil and gas companies in the spring-autumn seasons;
- carry out for marine mammal observation during special research onboard Russian fisheries vessels (if possible).

The volume of research and work will be dependent on funding which is uncertain as yet.

**Other**

Hammond informed the group that there was no word as yet on funding for the CODA project.[1]

The MAR-ECO project will continue in 2007 with a 4 week cruise by the *Bigelow*. The possibilities for coordination will be investigated.

## 2. REVIEW OF METHODOLOGICAL PROBLEMS ENCOUNTERED IN PREVIOUS SURVEYS

**Aerial surveys**

*Canada*

Recent surveys, the first in many years, have been conducted using standard single-platform aerial survey techniques from a Cessna 227 Super Skymaster, flown at 500 feet and ~100 knots. These surveys used two rear observers at bubble window positions, and a forward navigator/sighting recorder in the co-pilot position (off effort). Experimental surveys were conducted from a Canadian Armed Forces P-130 Aurora reconnaissance aircraft in March 2005 and 2006. Problems encountered for the Skymaster surveys included:

1. Low number of sightings of some species (*e.g.* fin and minke). This may mean that densities are relatively low and a high amount of effort will be required to get good abundance estimates.
2. Surveys cannot go far offshore (*e.g.*, approximately ≤120 n.mi.) because of operational safety concerns.
3. Small size of plane precludes full double platform methods. "Circle-back" method was not used so there is no estimation of *g(0)*.

It was noted that the *g(0)* issue could be addressed by using cue counting methods for some species (minke, fin, and perhaps blue whales), using circle-back procedures, using partial double platforms as in Icelandic surveys, and/or using literature values from similar surveys such as SCANS-II and NMFS.

The Aurora is a large 4-engined plane with 2 sets of bubble windows (plus other windows), making independent double platforms a possibility. The aircraft has significant range (longest flight to date has been 17 hours; usually 8-12 hours), high flight manoeuvrability, and room for up to 21 people.The main issue is the high flying speed, which at ~190 knots is more than twice as fast as that normally used in such surveys. The implications of this need to be addressed,.

*Greenland*

For Greenlandic surveys the main problem has been weather conditions, especially the prevalence of fog, during the summer. Aerial surveys have been found to be somewhat more efficient than ship surveys because they can take better advantage of short weather windows and are less expensive than ships to maintain in an "idle" mode during bad weather periods. Recent surveys have been conducted in September when fog is usually less prevalent.

Aerial digital photographic surveys were conducted in 2003 and 2004, but resulted in fewer than expected identified whales on the photographs. The reasons for this are unclear, but it was considered unwise at this point to rely on photography as a primary method before further experimental work is carried out. Witting noted that recent improvements and price decreases in

[1] The project did not receive EU funding. Other avenues are being explored.

camera equipment and in data storage might make digital photography a valuable secondary source of information, for species identification, confirmation of group size estimates and photogrametry. Witting agreed to look into the technical and cost aspects of this.

*Iceland*
Pike presented some recommendations for future aerial surveys that had been noted in a previous working paper (SC/10/AE/12). In general cue counting was considered an appropriate method for minke whales, and the data could be analyzed as a line transect for other species. A double platform, at least on one side of the plane, was necessary for determining perception bias and distance measurement error. The current monitoring system and software was somewhat cumbersome in that a laptop was required for each observer, but performed well. Special methods would be required to get better estimates of dolphin group size, if this is considered a priority.

Better estimates of harbour porpoise abundance are required for Iceland. It was considered that cue counting could work with this species, as they generally occur as singles and exhibit rather simple behaviour. Surfacing rate data is available for some areas, but not Iceland. However it was considered that experienced harbour porpoise observers would be required to get good estimates for this species, regardless of the methodology used. One possibility would be to use observers from SCANS-II, and apply the same correction factor for *g(0)* derived for that survey. This would require that the survey be flown at 600 ft, rather than 750 ft as used in previous surveys.

*Russia*
Russian surveys have been conducted using either a twin engine An-26 (named “Arktika) or L-410 aircraft. The aircraft have equipment including GPS and computer systems, infrared (IR) system (IR-radiometer and IR-scanner), digital photo- and video cameras and also systems for sea surface and subsurface layer temperature remote sensing. Few technical or methodological difficulties have been noted, but observation quality is of course dependent on weather conditions.

**Ship surveys**
The following issues were identified and discussed:

1. Species identification of non-target species. This is particularly a problem for the Norwegian surveys, which are dedicated to minke whales and operate in passing mode. For other areas it is a problem for dolphins and small whales, and large whales at distance. Greater use of “big-eye” or 7x50 binoculars could be made from one of the platforms or the bridge deck for species identification. Also observer experience is an important factor.
2. Implementation of Buckland-Turnock (B-T) tracking methodology was not very successful in 2001. Few tracks of target species were made. It was considered that the combination of large (fin) and small (minke) whales as target species made tracking problematic. Also tracking was found to be possible only under very good weather conditions (Beaufort 3 or less), while the vessels maintained effort up to Beaufort 5. The double platform methodology did produce data suitable for estimating *g(0)* for fin whales, but probably not for minke whales. Insufficient tracks were obtained to estimate responsive movement, which may be important for minke whales.

It was agreed that a double platform method was essential for smaller whales such as minkes, but less important for large whales. One possibility would be to stratify the survey such that full implementation of the B-T methodology is given higher priority in strata where high densities of minke whales are expected. This was considered feasible for the Icelandic survey area where the distribution of minke whales is predictable. The methodology could also change dependent on weather conditions, with B-T used only under optimal conditions. These options would have to be specified in the survey plan and protocol.

3. The angle and distance data for small whales, especially minkes, from Icelandic and Faroese surveys, exhibited features that made analysis problematic. These features included heaping at small angles and distances, and a secondary peak in sightings at medium distances. The reasons for this are unclear but are likely related to the combination of small and large whales as target species, and possibly to the use of binoculars on the primary platform. Suggestions for alleviating this problem included better angle and distance measurement techniques (see 4), the stratification scheme described above, and better observer training.
4. Problems with school size estimation, particularly for pilot whales and dolphins. If these species are considered a priority, special protocols will have to be developed. It was noted that such a protocol for pilot whales was implemented in the 1995 survey. The use of video cameras to record schools may also help, but again special protocols for their use would have to be developed.

## 4. METHODOLOGICAL ADVANCES FROM SCANS-II

Hammond and Desportes provided some information on new equipment and techniques used in SCANS-II. For ship surveys:

1. Big-eyes. These were used on the tracker platforms but their contribution in terms of successful trackings is not yet known. Some sightings picked up by the tracker platform were too far away and out of range of the primary platform.
2. Acoustics. The system functioned well on all vessels. It required very little time to set up, deploy and retrieve, and virtually no maintenance underway. The success of the system in terms of monitoring abundance has yet to be proved. It will be used in CODA, with the emphasis on dolphins, sperm and beaked whales. The cost of a system is moderate (about 7 K £) and the data will probably become more valuable as analyses are refined.
3. Photographic estimation of distance, using video. This functioned well in most cases. The estimates are assumed to be more accurate than visual estimates. However it is still necessary to estimate distances in the normal way as video cannot be used for every sighting, particularly when conditions are rough.
4. Photographic angle measurement. This system functioned very well and is highly recommended.

In the aerial surveys, the “circle-back” technique apparently functioned well and will result in useable estimates of $g(0)$ although these have not been finished yet. The technique requires practice by the pilot and crew, and a considerable allocation of effort to generate enough data for useable estimates.

## 5. COORDINATION WITHIN TNASS AND WITH OTHER SURVEYS

It was agreed by all participants that co-ordinated surveys greatly enhanced the value of each individual survey by allowing synoptic estimates to be produced, thus providing the best value in terms of information for money spent. The opportunity for having a synoptic survey of the Northern Atlantic from coast to coast was absolutely unique and the output of the survey should be optimized as possible through a high level of co-ordination, use of the newest standard survey techniques, and use of alternative techniques to collect data not usually collected.

While recognizing that each jurisdiction has species of greatest interest, it was agreed that the survey would be made multi-species to the extent possible, without compromising data on target species. A common survey protocol will be developed to optimize data collection for target species from all jurisdictions, and each jurisdiction will make efforts to collect good data on the target species of other jurisdictions.

Given the experience from previous surveys, it seems obvious that the analysis of survey data would also benefit from a more coordinated approach. It was agreed that this would be a topic for discussion at future planning meetings.

It was agreed that the timing of the surveys should be coordinated and be the same as most previous NASS, *i.e*. late June and July.

It was agreed that the recruitment and training of observers should be coordinated. It may also be possible to coordinate with CODA in these areas, but this remains uncertain at present.

It was agreed that a joint survey design will be developed at a future planning meeting. In addition a common survey protocol, applicable to both aerial and ship surveys, will be developed and used. It was recognized however that the Norwegian survey will continue to follow its own protocol, but will make every reasonable effort to coordinate with TNASS.

## 6. FUNDING

A joint funding proposal to the Nordic Council of Ministers (NC) was developed by Desportes and Pike and submitted in December 2005. Unfortunately it was rejected, but has been retained by the NC for possible funding through other programs. Desportes will follow up this proposal with people familiar with the NC system.

TNASS has been accepted as a component of the ESSAR project for the International Polar year. There is no funding attached to this acceptance, but it may enhance proposals for funding to other agencies.

It was agreed that the greatest needs for extra funding were for:

1. Extension of the Greenlandic and Canadian surveys so that they adjoin;
2. Possible placement of cetacean observers on ancillary surveys, such as Russian and German redfish surveys;

3. Purchase of new equipment, such as Big Eye binoculars, video cameras, distance measuring systems, and acoustic arrays;
4. Coordinated observer training.

An immediate need is to develop a full budget for the project, including costs of permanent staff involved, for use in funding proposals. All agreed to provide this information to Desportes as soon as possible.

Pike informed the group that NAMMCO would fund 2 planning meeting (other than this one), in 2006 and 2007, and a follow-up meeting in 2008. In addition some funding will be provided this year for project coordination. An application for additional funding for observer training, project management and contract analyses has been submitted. It was considered certain that some extra funds will be forthcoming, but the exact amount will not be known until 2007.

It was agreed that members would research opportunities for funding and convey these to Desportes, who would lead in developing joint funding proposals. Oil companies carrying out exploration in the survey area were considered an immediate possibility.

## 7. OTHER ISSUES

It may be feasible to conduct other activities, such as biopsy sampling, photography for individual recognition studies, and deployment of satellite tags during the survey, either from survey vessels or small boats deployed from them. However any such activities would have costs in terms of personnel and possibly lost survey effort, so their priority would have to be assessed in terms of these costs. Biopsy sampling was the most likely activity, and may be useful for genetic stock delineation of particularly fin whales. The group requested that the NAMMCO Scientific Committee recommend whether or not biopsy sampling or other ancillary activities were of sufficient priority that they should be attempted during the survey.

## 8. ACTION ITEMS

| NO. | ITEM | WHO? | WHEN? (m.yr) |
|---|---|---|---|
| **Survey Planning and Coordination** | | | |
| 1. | Provide budget information to Desportes. | Lawson, Witting, Víkingsson, Mikkelsen. | 05.06 |
| 2. | Contact MAR-ECO project to discuss coordination. | Mikkelsen. | 05.06 |
| 3. | Make contact regarding possibility of placing cetacean observers on Russian/German redfish survey vessels. | Víkingsson, Desportes, Zabavnikov. | 05.06 |
| 4 | Make contacts regarding possibility of conducting cetacean observations | Zabavnikov, Øien | 04.07 |

| NO. | ITEM | WHO? | WHEN? (m.yr) |
|---|---|---|---|
| | during annual Russian/Norwegian feeding mackerel research in the Norwegian Sea and annual Russian/Norwegian ecosystem surveys (with using aircraft and vessels). | | |
| 5. | Get information on the Canadian offshore survey activities. | Lawson | 05.06 |
| 6. | Apply for permits to enter territorial waters. | Víkingsson, Mikkelsen, Øien. | 01.07 |
| **Equipment/Methodology** | | | |
| 7. | Assess implications of a start/stop survey design as used on co-platform surveys. | Planning Group | 11.06 |
| 8. | Assess implications of high flying speed in aerial surveys (Aurora platform). | Planning Group. | 11.06 |
| 9. | Provide technical specifications and costs of video and angle measurement systems used on SCANS-II. | Desportes, Pike, Hammond. | 09.06 |
| 10. | Provide technical specifications and costs of acoustic monitoring system used on SCANS-II. | Desportes, Pike, Hammond. | 09.06 |
| 11. | Provide technical specifications and costs of digital photography system for aerial survey. | Witting, Zabavnikov. | 05.06 |
| 12. | Provide technical specifications and costs of sea surface temperature sensing equipment for aerial survey. | Lawson, Zabavnikov. | 05.06 |
| 13. | Address potential copywrite issues re. use of *Hval* software. | Gunnlaugsson. | 05.06 |
| 14. | Look at 2001 data to determine number of successful trackings by species. | Gunnlaugsson, Pike | 11.06 |
| 15. | Look at SCANS-II and SOWER data to determine relative success of big-eye vs 7x50 binoculars for tracking. | Hammond, Donovan | 11.06 |
| 16. | Estimate *g(0)* for minke whales and other species from 2001 NASS data. | Pike, Gunnlaugsson, Øien. | 11.06 |
| **Funding** | | | |
| 17. | Provide information on potential funding sources for a joint proposal to Desportes | All. | 06.06 |
| 18. | Follow up funding proposal to NC | Desportes, Pike | 06.06 |
| 19. | Develop new proposals as appropriate. | Desportes, Pike. | Ongoing |

| NO. | ITEM | WHO? | WHEN? (m.yr) |
|---|---|---|---|
| 20. | Develop project description for ESSAR-IPY | Desportes, Pike. | 05.06 |

## 9. NEXT MEETING

It was agreed that the next planning meeting will be arranged by NAMMCO in November 2006.

## 10. MISCELLANEOUS INFORMATION

Lawson informed the group that they DFO has four pairs of big eye binoculars, at least two of which could potentially be available for loan to TNASS partners. In addition they had recently purchased equipment to remotely sense sea surface temperature from an airplane, and Lawson agreed to supply technical specifications for this.

**APPENDIX 1**

## LIST OF PARTICIPANTS

Jack Lawson, Canada
Lars Witting, Greenland
Gisli Víkingsson, Iceland
Thorvaldur Gunnlaugsson, Iceland
Bjarni Mikkelsen, Faroe Islands
Nils Øien, Norway
Greg Donovan, IWC
Phil Hammond, CODA, SCANS-II, SMRU
Daniel Pike, NAMMCO, rapporteur
Genevieve Desportes, NAMMCO/Faroe Islands, Chair.