Appendix 8

The 44th Session of the Joint Norwegian - Russian Fisheries Commission, Oslo, Norway, 6-10 October 2014

REPORT OF THE WORKING GROUP ON SEALS

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1. EXCHANGE OF INFORMATION AND SUMMARY OF SEAL CATCHES IN 2014

Norwegian catches in the Greenland Sea (West Ice) in 2013 was taken by 3 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 2014. Only some animals were taken for scientific purposes. The 2014 TAC for harp seals in the Greenland Sea was set at 21 270 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. Total catches in 2014 were 11,986 (including 9,741 pups) harp seals, representing 49% of the identified sustainable levels.

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 17,400 1+ animals (where 2 pups balance one 1+ animal) in the White and Barents Sea in 2014. The Joint Norwegian-Russian Fisheries Commission has followed this request and allocated 7,000 seals of this TAC to Norway. On this background, Russian sealing in 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 2009-2013, no commercial Russian harp seal catches in the White Sea in 2014. Also, no Norwegian vessels aimed for the hunting area in the southeastern Barents Sea (the East Ice) in 2014.

Norwegian and Russian catches in 2014, including catches under permits for scientific purposes, are summarized in the table below:

Area/species	Norway	Russia	Sum
GREENLAND SEA			
Harp seals			
Pups	9741	0	9741
Older seals (1yr+)	2245	0	2245
Sum	11986	0	11986
Hooded seals			
Pups	24	0	24
Older seals (1yr+)	0	0	0
Sum	24[1]	0	24
Area subtotal	12010	0	12010
BARENTS SEA / WHITE SEA			
Harp seals			
Pups	0	0	0
Older seals (1yr+)	0	0	0
Sum	0	0	0
Area subtotal	0	0	0
TOTAL CATCHES	12010	0	12010

[1] 22 animals taken under permit for scientific purposes, 2 animals taken by mistake in hunt

2. EXCHANGE OF INFORMATION AND SUMMARY REPORTS OF RESEARCH ACTIVITIES IN 2014

2.1 Norwegian research

2.1.1 Estimation of harp and hooded seal pup production in the Greenland Sea

In 2012, IMR conducted aerial surveys in the Greenland Sea pack-ice (the West Ice), to assess the pup production of the Greenland Sea populations of harp and hooded seals. The survey resulted in a total pup production estimate for harp seals of 89 590 (SE = 12 310, CV = 13.7%), which is lower than estimates obtained in similar surveys in 2002 and 2007. The total estimate of hooded seal pup production was 13 655 (SE = 1 900, CV = 13.9%), which is lower than estimates obtained from comparable surveys in 2005 and 2007.

The use of traditional photo aircrafts to assess seal populations in remote areas, such as the West Ice, is expensive, and has also become more difficult to operate during recent years. Few airports are available in the area: Constable Point in East Greenland, Akureyri in Iceland and one primitive landing stripe on the island Jan Mayen. The latter is not even always available. The Greenland airport is the main base – due to the ice conditions this arrangement requires that fuel for the operation is shipped to Constable Point the autumn before the surveys are carried out. With funding from the Norwegian Research Council (NRC), IMR has now started experiments with alternative (and cheaper) methods to perform photobased aerial surveys of seals in the West Ice. A research survey was conducted with KV "Svalbard" to the West Ice during 16 to 26 March 2014. The aim of the survey was to test the usefulness of UAVs (Unmanned Aerial Vehicles), operated by the Northern Research Institute (Norut), to perform aerial photographic surveys of harp and hooded seal whelping patches on the drift ice. Two drones were tested: One small (wingspan 2.10 m) with electromotor and one larger (wingspan 3.80 m) petrol-driven UAV. Digital cameras were used, and the largest UAV was also instrumented with thermal infrared (IR) camera. Both aircrafts were launched by a mechanical launcher from the ship deck. The smaller UAV could be landed on KV Svalbard's helicopter platform, while the larger had to be landed on ice floes, preferably at least 80 m long and 20 m wide. Both UAVs fly along predefined transects and altitudes, both can be changes throughout the flight using satellite based communication. The UAVs are landed manually. The main aim of the pilot investigations in 2014 was to explore various survey altitudes and camera settings to obtain an optimal altitude and camera set up for photographing seal pups. Simultaneous use of digital and IR cameras enabled exploration of combinations of those to detect and classify seals. Experience obtained from using the UAVs and the quality of the images taken, are promising. Both harp and hooded seals, including pups, were easily identified on the images taken at a flight altitude of 300 m (the usual altitude for photographing during traditional surveys). Also preliminary results from the IR camera are promising. It is, however, necessary to improve the range of the largest UAV and the methods for landing the aircraft on ice floes. Also some technical improvements on both aircrafts and operational equipment should be performed. A new survey, building on the experience gained in 2014, will be conducted in the West Ice in 2015.

Manual analysis of images obtained in aerial photographic surveys is extremely time consuming

and costly, and involves subjective human interpretation by trained experts. For this reason, the UAV project, funded by NRC, also aims at developing methodology for automating the process of counting seals from aerial images. This will be achieved through the development of new image analysis and pattern recognition techniques tailored to detect seals in digital color images. This part of the work occurs in close cooperation with the Norwegian Computing Center, Oslo.

2.1.2 Harp and hooded seal feeding habits in the West Ice

IMR harp (and hooded) seal diet data (contents from gastrointestinal tracts and faeces) have been collected in summer 2008 and 2010 along the ice edge east of Greenland between 71°N and 79°N. Most samples were taken in hooded seal moulting areas in the West Ice from 71°N to 73°N. In total, gastrointestinal tract samples were taken from 179 hooded seals and 20 harp seals, additionally 70 faeces samples were taken from harp seals on the ice. The observed diet varied considerably between the two species. Polar cod dominated the hooded seal diet which also included squid and some other fish species. For harp seals, the diet was particularly characterized by the pelagic amphipod *Themisto* sp. In addition the harp seals had taken some krill and polar cod. Squid contributed much less to the hooded seal diet in this study than in previous studies in the same area.

2.2 Russian research

2.2.1 Estimation of harp seal pup production in the White Sea

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

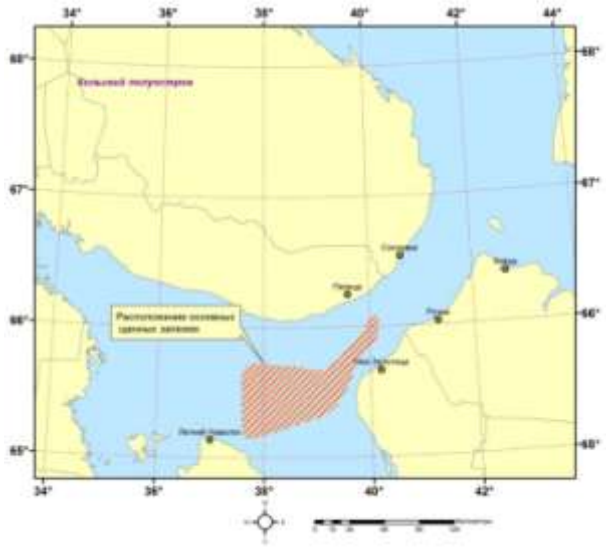

Figure – Location of the harp seal whelping patches in the White Sea in March 2013

2.2.2 Other issues

During late spring, summer and early autumn in 2014, several dedicated expeditions were carried out in the Kola Peninsula coastal zone in the Barents Sea area, using small boats and vessels. In the Barents Sea open area, opportunistic sighting surveys onboard research and fisheries vessels, including the annual joint Russian-Norwegian ecosystem surveys, were carried out. During all surveys mentioned, data on marine mammal distribution and numbers were collected, taking into account also environmental conditions and fish species distributions and biomass. The main aim was to attempt to estimate marine mammals and fisheries interactions on one side, and influence of current climatic changes and human activity on marine mammals on the other. Research on mathematical modeling designed to estimate the total White Sea/Barents Sea harp seal population stock abundance and develop recommendations concerning harvesting strategy were continued.

2.3. Joint Norwegian-Russian work

2.3.1 Joint studies of life history parameters

Reproductive samples were taken from about 50 harp seal females in the southeastern Barents Sea in early May 2011. Because very few young seals were included in the sample, it could not be used for determination of age at maturity. Pregnancy rate was however estimated at 0.84 (SD=0.11) based on the presence or absence of a regressing *corpus luteum* in 46 adult females. This is significantly higher than a comparable estimate of 0.68 (95% CI=0.12) from 2006, but exactly equal to a fetus-based estimate from 1990-92. A new estimate of age at maturity is 3 years overdue for this stock in order to keep it “data rich” within the ICES framework

Data for assessment of biological parameters were collected from 198 harp seal females during commercial sealing in the West Ice in 2014 – analyses are in progress.

3. STATUS OF STOCKS AND MANAGEMENT ADVICE FOR 2015

The ICES Working Group of Harp and Hooded Seals (WGHARP) met during 26-30 August 2013 at PINRO, Murmansk, Russia, to assess the status and harvest potential of stocks of Greenland Sea harp and hooded seals and harp seals in the White Sea. The advice given by ICES in September 2013, based on the 2013 WGHARP meeting, were used by this Working Group on Seals to establish management advice for 2015 to the JNRFC.

The basis for the advice was a request from Norway in September 2012 where ICES was requested to assess the status and harvest potential of harp seal stocks in the Greenland Sea and White Sea/Barents Sea and of the hooded seal stocks in the Greenland Sea, and to assess the impact on the harp seal stocks in the Greenland Sea and the White Sea/Barents Sea of an annual harvest of: 1) Current harvest levels; 2) Sustainable catches (defined as the fixed annual catches that stabilizes the future 1+ population); 3) Catches that would reduce the population over a 10-year period in such a manner that it would remain above a level of 70% of current level with 80% probability.

ICES have developed a Precautionary harvest strategy for the management of harp and hooded seals. The strategy includes two precautionary and one conservation (limit) reference levels. The reference levels relate to the pristine population size, which is the population that would be present on average in the absence of exploitation, or a proxy of the pristine population (which in practical terms is referred to as the maximum population size historically observed, N_{max}). A conservation, or lower limit reference point, N_{lim}, identifies the lowest population size which should be avoided with high probability. The first precautionary reference level is established at 70% (N_{70}) of N_{max}.When the population is between N_{70} and N_{max}, harvest levels may be decided that stabilise, reduce or increase the population, so long as the population remains above the N_{70} level. ICES has suggested that this could be done by designing the TAC to satisfy a specific risk criterion which implicate 80% probability of remaining above N_{70} over a 10-year period. When a population falls below the N_{70} level, conservation objectives are required to allow the population to recover to above the precautionary (N_{70}) reference level. N_{50} is a second precautionary reference point where more strict control rules must be implemented, whereas the N_{lim} reference point (set by ICES at 30% (N_{30}) of N_{max}) is the ultimate limit point at which all harvest must be stopped.

The ICES management of harp and hooded seals require that the populations in question are defined as “data rich”. Data rich stocks should have data available for estimating abundance where a time series of at least three abundance estimates should be available spanning a period of 10-15 years with surveys separated by 2-5 years, the most recent abundance estimates should be prepared from surveys and supporting data (e.g., birth and mortality estimates) that are no more than 5 years old. Stocks whose abundance estimates do not meet all these criteria are considered “data poor”, and should be managed more conservatively.

Population assessments were based on a population model that estimates the current total

population size, incorporating historical catch data, estimates of pup production and historical values of reproductive rates. The modelled abundance is projected into the future to provide a future population size for which statistical uncertainty is provided for various sets of catch options. In case of "data poor" populations, catch limits are estimated using the more conservative Potential Biological Removal (PBR) approach.

3.1. Greenland Sea

The Working Group **recommends** the opening dates for the 2015 catch season to be between 1 and 10 April for catches of both weaned harp seal pups and adult moulting harp seals. The Group recommends a closing date set at 30 June (2400 GMT) for harp seals. Exceptions on opening and closing terms may be made in case of unfavourable weather or ice conditions.

The Working Group agree that the ban on killing adult females in the breeding lairs should be maintained in 2015.

3.1.1 Hooded seals

Results from the most recent (2012) pup survey suggest that current pup production remains very low, and lower than observed in comparable surveys in 1997, 2005 and 2007. Due to some uncertainty regarding the historical data on pregnancy rates, the population model was run for a range of pregnancy rates (assuming that 50%, 70% or 90% of the mature females produced offspring, respectively). All model runs indicated a population currently well below N30 (30% of largest observed population size). Recent analyses have indicated that pregnancy rates have remained rather constant around 70% in the period 1958 – 1999. Using this scenario, the model estimates a 2013 total population of 82 830 (95% C.I. 67 104 – 98 573).

Catch estimation: 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.

The Working Group recommends that this ICES advice is implemented in future managenment of hooded seals in the Greenland Sea: Removals should still be prohibited until more information about current stock status becomes available.

3.1.2 Harp seals

The assessment model trajectory suggests an increase in the Greenland Sea harp seal population abundance from the 1970s to the present (2013) abundance of 627 410 (95% C.I. 470 540 – 784 280) animals.

Catch estimation: ICES consider this population to be data rich, and above the N_{70} level (i.e., more than 70% of known maximum abundance measured). Thus, it is appropriate to provide catch advice using the assessment model and to apply the Precautionary harvest strategy. Current catch level will likely result in an increase in population size of 21% over the 10 years period

2013-2023, whereas a catch of 14 600 1+ animals, or an equivalent number of pups (where one 1+ seal is balanced by 2 pups), per year would sustain the population at present level over the same period.

Catches that would reduce the population over a 10-year period in such a manner that it would remain above a level of 70% of current level with 80% probability are 21 270 1+ animals, or an equivalent number of pups (where one 1+ seal is balanced by 2 pups), in 2014 and subsequent years. Any allowable catch should be contingent on an adequate monitoring scheme to detect adverse impacts before it is too late for them to be reversed, particularly if the TAC is set at a level where a decline is expected.

The Working Group recommend that the advice from ICES be used as a basis for the determination of a TAC for harp seals in the Greenland Sea in 2015:

- *If the management objective is to maintain the population at current level, a TAC of 14 600 1+ animals or an equivalent number of pups, is recommended.*
- *If the management objective is to reduce the population towards N_{70} over a 10-year period, a TAC of 21 270 1+ animals, or an equivalent number of pups, is recommended.*

In both harvest scenarios, one 1+ seal should be balanced by 2 pups.

3.2 The Barents Sea / White Sea

Current Russian regulations allows for seal hunting in the White Sea and southeastern Barents Sea from 20 March to 1 May. Both Parties **recommends** an extension of the hunting season which should include the entire period from 20 March to 15 May for the whole area. Exceptions from opening and closing dates should be made, if necessary, for scientific purposes.

The Working Group agreed that the ban on killing adult harp seal females in the breeding lairs should be maintained in 2015.

3.2.1. Harp seal.

Russian aerial surveys of White Sea harp seal pups were conducted March 2004, 2005, 2008, 2009 and 2010 using traditional strip transect methodology and multiple sensors. The results obtained may indicate a reduction in pup production as compared with the results obtained in similar surveys in 1998-2003:

YEAR	ESTIMATE	C.V.
1998	286 260	.150
2000	322 474	.098
	339 710	.105
2002	330 000	.103
2003	327 000	.125

2004	231 811 234 000	.190 .205
2005	122 400	.162
2008	123 104	.199
2009	157 000	.108
2010	163 032	.198

As a result of the 2009 and 2010 surveys, regarded to be good by WGHARP, the Working Group feel that the reduced pup production observed since 2004 does not appear to be a result of poor survey timing, poor counting of imagery, disappearance/mortality of pups prior to the survey or increased adult mortality. According to WGHARP, the most likely explanation for the change in pup production seems to be a decline in the reproductive state of females.

The population assessment model used for the White Sea/Barents Sea harp seal population provided a poor fit to the pup production survey data. Nevertheless, ICES decided to use the model which estimated a total 2013 abundance of 1 419 800 (95% C.I. 1 266 910 – 1 572 690). The modelled total population indicates that the abundance decreased from 1946 to the early 1960s, but has generally increased since then.

Catch estimation: Based on current data availability, the Barents Sea / White Sea harp seal population is considered to be "data poor". The modelled total population in 2013 is estimated to be about 83% of N_{max}. Current catch level will likely result in an increase in the population size of 13% over the 10 year period 2013-2023. The equilibrium catch level is 17 400 1+ animals, or an equivalent number of pups (where one 1+ seal is balanced by 2 pups), in 2014 and subsequent years. A catch level of 26 650 1+ animals, or an equivalent number of pups (where one 1+ seal is balanced by 2 pups) will bring the population size down to N_{70} with a probability 0.8 within 10 years. The PBR removals are estimated to be 40 430 (14% pups) seals. This catch option indicates a 16% reduction of the 1+ population over the next 10 year period.

Despite the fact that this population is now classified as data poor, ICES expressed concerns over the high removals and declining population resulting from the PBR estimations, and concluded that the estimated equilibrium catches were the most preferred option.

The Working Group suggest that the advice from ICES be used as a basis for the determination of a TAC for harp seals in the White Sea / Barents Sea in 2015: A TAC of 17 400 1+ animals, or an equivalent number of pups (where one 1+ seal should be balanced by 2 pups), is recommended.

3.2.2 Other species

The Working Group agreed that commercial hunt of bearded seals should be banned in 2015, as

in previous years, but it **recommend** to start catch under permit for scientific purposes to investigate results of long time protection.

4. RESEARCH PROGRAM FOR 2015+

4.1. Norwegian investigations

Secure that the stocks remain data rich:

- Analyze new (from 2014) data on fertility and condition for harp seals in the West Ice
- Collect new data on biological parameteres for harp seals in the East Ice as soon as possible
- Improve the population modell used in assessments of harp and hooded seals

Killing methods in Norwegian commercial sealing

- Collection of material to assess efficiency and animal welfare issues in the Norwegian commercial sealing will be continued during commercial sealing of harp seals in the Greenland Sea in April/May in 2015.

Focus on the difficult sock situation for hooded seals:

- Analyzes oof collected biological material from the West Ice

Analyses of historical data from harp seals

- Applies to the East Ice: biological parameteres and trophical level

Seal diets

- Publication of new data from the West Ice (harp and hooded seals, gastrointestinal tract contents and faeces).
- Analyzes of stable isotopes and fatgty acids from harp seals and their prey in the Barents Sea

Tagging with satellite based tags, harp seals in the White Sea

- Maybe we finally can do this in 2015

Observations of marine mammals on the ecosystem surveys

- Was abandoned in 2014 for economical reasons – must be resumed in in 2015.
- As in 2014 the survey will be extended to include also the polar ocean – continued observations of mammals must be secured.

4.2.Russian investigations

4.2.1 Estimation of the White Sea/Barents Sea harp seal pup production

The plan is to continue standard multispectral aerial surveys to estimate pup production – subsequently these data will be used to determine the total harp seal population size by modelling. This information is very important, both for the management of the stock and for the Joint Norwegian-Russian Research Program on Harp Seal Ecology (Harp Seal Ecology Program – HSEP). Also this research will be carried out under recommendations from the WGHARP 2013 meeting.

4.2.2 The White Sea/Barents Sea harp seal population biology

Research on harp seal reproductive biology is planned to be carried out in the White and the Barents Seas. The aim is to study harp seal biological data such as mortality, maturity, birth rate, and morphological and physiological indexes. During spring, work will be continued on pup mortality estimation in the White Sea. Plans include also continuation of research on harp seal feeding in the White and the Barents Seas during spring and summer. All these research activities will be carried out under the HSEP and recommendations from the WGHARP 2013 meeting.

4.2.3 Marine mammal species distribution and numbers

In 2015 annual research of marine mammal distribution and numbers in dedicated surveys will be continued using specially equipped aircraft, research and commercial fisheries vessels in the coastal zones (on base of small boats and coastal sightings using) as well as in the open areas of the Barents Sea, White Sea, Kara Sea and Laptev Sea. The main purpose of these surveys is to study marine mammal role in the marine ecosystems, including influence upon fisheries as top predators.

4.3. Joint Norwegian - Russian investigations

4.3.1 Joint Research program on harp Seal Ecology

Harp seals are the most important marine mammal top predators in the Barents Sea. To be able to assess the ecological role of harp seals by estimation of the relative contribution of various prey items to their total food consumption in the Barents Sea, more knowledge both of the spatial distribution of the seals over time, and of their food choice in areas identified as hot-spot feeding areas is urgently needed. For this reason, the Joint Norwegian-Russian Fisheries Commission has decided to initiate a joint research program on harp seal ecology aimed to:

- assess the spatial distribution of harp seals throughout the year (experiments with satellite-based tags)
- assess and quantify overlap between harp seals and potential prey organisms (ecosystem surveys)
- identify relative composition of harp seal diets in areas and periods of particular intensive feeding (seal diet studies in selected areas)
- secure the availability of data necessary for abundance estimation
- estimate the total consumption by harp seals in the Barents Sea (modelling)
- implement harp seal predation in assessment models for other relevant resources (modelling)

The program was adopted by the Joint Norwegian-Russian Fisheries Commission in 2006. Although both ecosystem surveys and abundance estimation of harp seals are in progress, the core activities of the program have not yet been properly started. The parties had planned to deploy satellite transmitters on harp seals in the White Sea in late May in 2007-2011. However, this proved impossible due to some limitations regarding deployment of telemetric tags in all years. Later, in 2013 and 2014, these limitations were removed, but lack of funding hampered the tagging of seals this year. In 2015 IMR is attempting to obtain funding (from the Norwegian

Research Council) to carry out satellite tagging in the White Sea. During the planned tagging experiment, PINRO will provide the necessary logistics required for helicopter- or boat-based live catch of seals in April-May 2015. IMR 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. All data obtained from the tags will be available for both PINRO and IMR scientists. Both US and Russian transmitters can be used. The transmitters cannot collect geographically positioned temperature and salinity data.

After the 2015 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.

4.3.2 Other issues

Life history parameters in seals

Russian scientists have participated in scientific work on Norwegian sealers during March-May both in the southeastern part of the Barents Sea and in the Greenland Sea. This type of Norwegian-Russian research cooperation is encouraged also in the future. This would enable coordinated and joint sampling of new biological material. If Russia can realize scientific or commercial vessel trips in the White, Barents and Greenland Seas, invitation for participation of Norwegian scientists is desirable.

Reconnaissance of possible new harp and hooded seal breeding patches in the Greenland Sea

Substantial changes in extent and concentration of drift ice in the Greenland Sea may have triggered behavioral changes of such a magnitude as a relocation of breeding for at least parts of the seal populations. The Working Group **recommends** that this is further examined by using aerial surveys.

Reconnaissance of possible new harp seal breeding patches outside the White Sea

Possibilities to account for the reduced harp seal pup production in the White Sea since 2004 include a shift in contemporary pupping to areas outside of the traditional areas. During the late 1980s or early 1990s, some reports of harp seal pups being observed in Svalbard were received. Therefore, the Working Group conclude that it is important that areas in the northern and southeastern Barents Sea and Kara Sea (south western part) be searched during future aerial reconnaissance surveys.

Population model improvements

Work with improvements of the population model used for northeast Atlantic seal stocks, incorporating variable reproductive parameters and, if possible, also observed ecological variations, continues. This work occurs in close cooperation with Canadian scientists, but also other relevant institutions (e.g., SMRU in St. Andrews) may be included.

Comparison of methods used in pup production estimation

The Parties plan to continue work on comparison of methods used in pup production estimation, including both reading of images and subsequent calculations of the aerial survey data. This will continue the successful work started in 2009, and should include participation from Canada and Greenland.

4.4. Necessary research takes

For completion of the proposed Norwegian and Russian research programs, the following numbers of seals are planned to be caught under special permits for scientific purposes in 2015:

Area/species/category	Russia	Norway
Barents Sea / White Sea		
Whelping grounds		
Adult breeding harp seal females	300	0
Harp seal pups	100	0
Outside breeding period		
Harp seals of any age and sex	120	300
Greenland Sea		
Whelping grounds		
Adult breeding harp seal females	0	0
Harp seal pups	0	0
Adult breeding hooded seal females	0	50
Hooded seal pups	0	50
Outside breeding grounds		
Harp seals of any age and sex	0	200
Hooded seals of any age and sex	0	0

5. OTHER ISSUES

5.1 Bans on seal hunting and products

From a scientific point of view there is no doubt that harp and hooded seal stocks in the North Atlantic are well managed and sustainably harvested with acceptable hunting methods. This is acknowledged both by ICES and NAMMCO. As concluded by NAMMCO, this is a non-scientific step backwards in relation to requested ecosystem based management of all marine resources, seals included. Excluding the possibilities to harvest at all levels in the ecosystem may in the long run have implications for harvest possibilities at other levels than those decided to be excluded.

5.2 Observations of marine mammals on the ecosystem surveys

The PINRO and IMR scientists acknowledge the importance of ecosystem surveys in the research of the ecology of marine mammals in the Barents Sea. In 2013 only one marine mammal observer was onboard “Helmer Hanssen” – all other ships had two. The observations indicated increased aggregations of both baleen whales and toothed whales in the northern parts of the Barents Sea. In the southern areas, however, fewer hales were observed in 2013 as compared with previous years.The PINRO and IMR scientists emphasize the need of two observers per ship (as defined in the survey protocol) and agreed on the necessity to continue aerial observation of marine mammals and environmental conditions from Russian research aircraft, which was carried out annually from 2003-2005 as part of ES. Aerial surveys are particularly efficient for obtaining high

quality results from a large area over a short time period.

5.3 Joint research program on grey seals

In Norway grey seal pup production surveys aimed to cover all the breeding colonies along the entire coast were conducted in 2006-2008 using boat based as well as aerial surveys. New pup production surveys will be initiated this autumn, presumably starting with coverage of the northmost parts of Norway (Finnmark and Troms). There are large breeding colonies of grey seals located on the Murman Coast in Russia. Previous tagging experiments have shown that there is exchange of seals between these colonies and feeding areas in North Norway. Abundance estimation, using pup counts, in the Russian colonies has not been performed since 1991. For this reason, both Parties **recommend** that the Russian grey seal breeding colonies at the Murman Coast should be covered again. Ideally each colony should be visited three times (minimum twice) during the breeding period. The Parties discussed possibilities of multispectral surveys carried out by PINRO using a smaller aircraft. Norwegian participation in the grey seal surveys in Russia is highly recommended by both Parties. Traditionally the Russian grey seal colonies have been surveyed by Murmansk Marine Biological Institute (MMBI), and continued cooperation with MMBI is encouraged.

The parties agreed that this task can be most effectively solved within the frames of a future joint research program, preferably developed within the frames of the JRNFC. In addition to abundance estimation, also other important issues should be addressed:

- Stock identity: Do the Murman Coast grey seal colonies constitute isolated stocks, or are they part of the stock distributed in North Norway north of Vesterålen? This question can be addressed using genetic analyses.
- Spatial distribution and habitat use, e.g., what are the feeding areas for the Russian grey seals? Could be addressed by using satellite tags.
- Feeding habits and conflicts with fisheries and fish farming (diet studies).

6. APPROVAL OF REPORT

The English version of the Working Group report was approved by the members on 8 October 2014.