



Seals and Society

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Preface

The Nordic and Baltic Ministers responsible for Fisheries and Aquaculture, Agriculture, Food and Forestry adopted at a meeting in Jevnaker 7-8 November 2006 declaration on the grey seals in the Baltic Sea. The Ministers were very concerned of the socio-economic development of the coastal communities in the Baltic Sea area and aware of the serious situation for the coastal fisheries and the need to find new ways to diversify the economic activities of the coastal communities. Seals in some areas are a serious economic threat to the coastal fisheries, with consequences of reduced catches and destroyed fishing gears. On the other hand seal utilization has had historical importance to the coastal community as a vital resource of food and utility and there were concerns about the loss of knowledge and the need to improve and develop a market for Baltic seal products. So, there is a urgent need to promote discussions and a study on how the Baltic seal populations should be managed in view of present and foreseeable legislation and taken into account regional differences and needs.

This declaration boosted an idea to organize an international seal conference to revisit ecological and management issues on seal stocks both in the North Atlantic and the Baltic Sea. Ten years ago in November 1997, NAMMCO organised a major international conference entitled “Sealing the Future” which was held in St. John's, Newfoundland, Canada and their Annual Meeting in early 2007, the Council of NAMMCO discussed the potential for collaboration with the Nordic Council of Ministers on a public conference focusing on seals and sealing, which could provide a useful and up-to-date information tool/reference on seals, sealing, management policies and trade issues for an international public.

Therefore Nordic Council of Ministers’ effort was combined with NAMMCO to organize an international “Seals and society - how to manage resources and interactions in the Baltic Sea and North Atlantic” conference in 2007 and a special emphasis was given to the Baltic Sea. The main organizer were Nordic Council of Ministers and Finnish Game and Fisheries Research Institute, Finland under their presidency in 2007 in NCM. A Program Committee and a local Organizing Group were founded with representatives from the various organizations with a responsibility to draft a detailed program for the conference and to invite key-note speakers for each of the theme sessions. The Conference was organized by the following parties:

Nordic Council of Ministers
 Ministry of Agriculture and Forestry (Finland)
 Finnish Game and Fisheries Research Institute (Finland)
 Ministry of Fisheries and Coastal Affairs (Norway)
 Swedish Environmental Protection Agency (Sweden)
 Swedish Board of Fisheries (Sweden)
 North Atlantic Marine Mammal Commission (NAMMCO)
 Helsinki Commission (HELCOM)
 World Wide Fund for Nature (WWF)
 The Kvarken Council (Finland)

The main aim and the focus of the Conference was to generate, through presentations and discussions, solutions towards implementing sustainable management strategies to seal stocks and interactions between seals and society taking into account the implementation of ecosystem approach and favorable state of conservation of seal species. The second aim of the conference was to exchange experiences and constraints encountered so far in the Baltic Sea and North Atlantic and to identify strategies and best practices that will facilitate further implementation of seal stocks management and conservation.

The conference venue was at the west coast of Finland, in Vaasa, Finland at 16-18 October 2007, and in all, 125 scientists, managers, policy-makers and stakeholders attended to this international multi-disciplinary conference, which provided a very good venue to discuss recent advances and innovative ideas, share experiences, develop new avenues and create networks for sustainable management of seals in the Baltic Sea and North Atlantic in the future. Invited key-note speakers were introducing each theme session and they gave overviews and different perspectives to the topics covered.

At the end of the conference a panel discussion was organized, which summarized together with participants the results of the conference.

I believe that it is justified to say that the conference provided an outstanding program, which included presentations from world renowned scientists, well known managers and representatives from effective organizations. They all presented their results, views, opinions and strategies on seals and seal stocks in five different theme sessions on topics which also include the ecosystem approach to management of seal stocks.

This report summarizes each of topics covered by a short abstracts given for the presentations and it is followed by a short summary of the discussion after each presentation. This report is addressed primarily to decision- and policy makers in natural resource management and conservation within national and international authorities and institutions.

Helsinki 29 May 2008

Eero Aro
 Conference convener

Summary

Sealing has long been an important part of the economy and culture of many local communities in the Baltic Sea and North Atlantic. Most of the seal stocks exploited presently are abundant and healthy, providing a basis for continued sustainable use. The program of the International Conference on “Seals and Society – How to manage resources and interactions in the Baltic Sea and North Atlantic” was divided to five theme sessions covering a variety of important topics on the ecosystem effects of seal stocks, their conservation, conflicts with fisheries and seal stocks’ sustainable use. The conference was addressing also seals as a valuable natural resource and discussed how to conserve and manage seal stocks in the Baltic Sea and North Atlantic in the future. The conference was summarized by a theme and panel discussion “Sealing the future”, which was participated by renowned scientists, well known managers and representatives from effective organizations as well as other conference participants. They all presented their results, views, opinions and strategies on seals and seal stocks. The following is shortly summarizing the main conclusions, opinions and results from the conference presentations and discussions. Details are given in corresponding theme session chapter in the report.

In the Baltic and the North Atlantic, after decades of steady exponential growth of stocks, many marine mammal populations show much slower growth rates and some of them even decreasing trends. For these changes in population growth rates there are not always apparent explanations even in retrospective. Thus it is vital to develop early-warning criteria to be able to detect signs of major changes in the status of populations, but also for the general understanding of the ecological mechanisms behind such sudden changes. One explanation to explore is that density dependence affects the power of detecting trends in population growth, and it is really only during the exponential growth phase that population trends are significant. It is possible to detect a trend in decreasing population growth as density dependence starts to set in, though a measurement window of about 15-20 years. Monitoring of a population’s status relative to carrying capacity requires long time series of intensive data collection, particularly on pup production. While it may not be realistic for some jurisdictions to mount this sort of effort, the assessment of a population’s true conservation status does require some knowledge of its number relative to carrying capacity.

In the Baltic Sea both ringed and grey seals have similar historical population development. Both stocks declined in at the beginning of 2000s mainly due to the overexploitation. This development followed by

a minor decline in the 1970s due to contaminants causing reduced fertility. In most recent decades both stocks have increased, especially grey seals. It has been predicted that both species will increase in medium term (5-10 years) and will enlarge their distribution areas. The pressure to regulate populations will increase in long term assuming that populations will increase. Global warming may reduce ice cover and lead to less breeding habitat for both species but especially for ringed seals

In the North Atlantic, harbour seals are distributed along the east coasts of US and Canada, southwest Greenland, Iceland, Ireland and UK, including the Orkneys and Shetland, northern coast of France, Wadden Sea, southern Scandinavia and Baltic, including Kalmar Sund, the Norwegian coast, including Svalbard, and the Kola coast in Russia. The harbor seal stock along the East US coast has increased during the last 20 years. Most of the other stocks have been reduced due to the phocine distemper virus (PDV) outbreaks in 1988 and 2002, human impact (hunting and bycatch), recruitment failure due to increased competition with other species (grey seals) and predation by sharks. The status for some stocks are unknown due to lack of monitoring. In the Faroes the harbor seal is exterminated as a breeding species. In Greenland the harbour seal is severely depleted and in Kalmar Sund in the Baltic the species is depleted but increasing.

In the North Atlantic, harp, hood and grey seals are common. Harp and hood seals are seasonal migrants, spending the summer in Arctic waters of Davis Strait and off southeast Greenland. Both species migrate to northern Atlantic waters during late fall; breeding occurs in March on the drifting pack ice off eastern Canada and in the Gulf of St. Lawrence. Grey seals disperse from major breeding sites on Sable Island and in the Gulf of St. Lawrence to summer along the Atlantic coast and throughout the Gulf. Harp seal abundance increased from a low of around 1.8 million animals in the early 1970s to over 5 million animals by the mid-1990s, since then the population has changed little. Grey seals also increased rapidly from around 20,000 animals in eastern Canada in the 1970s to over 250,000 animals today. Although growth has been more or less exponential, the rate of increase, particularly on the main colony at Sable Island appears to be slowing. Hooded seals have shown little change in population size since the 1970s, with a total population estimated to be just under 600,000 in 2005.

Conflicts arising from the competition of humans and wildlife for biological resources are as old as mankind. Where conservation management becomes a success this often reignites old conflicts. To reconcile such conflicts we need ecologically effective, economically efficient, and socially acceptable means to manage the conflicts. This is most successful if management and policy have adequate tools in place well before a conflict becomes virulent. An interdisciplinary team of scientists from nine European countries have studied this question in the EU-project FRAP –

Framework for Biodiversity Reconciliation Action Plans. The aim was to use fisheries and fish-eating vertebrates (seals, otter, and cormorants) as model cases to assess and illustrate successful approaches for conflict reconciliation. The situation differs strongly across Europe and among species, ranging from no conflict to escalation at the local, regional, or European level.

Is there a characteristic process model to be derived from the history of the relative advanced conflict management in seal conflicts? An element of joint learning is the building of trust between the stakeholders with different interests. A rather controversial debate and dissent about the conflict and its solution in the first years of the conflict has been followed by more trust, consensus, and partial or temporary solutions that emerged as soon as not just single measures have been opted for, but more balanced solutions through combinations of different kinds of measures.

Seals impact commercial fisheries and commercial fish stocks. However, the impact of marine mammals, particularly seals, on the recovery of depleted fish stocks is a controversial issue and the focus of significant research efforts. A number of studies have attempted to determine the impact of seals on fish stocks in the Northwest Atlantic, particularly the impact of harp and/or grey seals on Atlantic cod. In general, these studies have indicated that although seals consume substantial amounts of commercial fish species and important forage species, the impact of these removals on the current fish stocks is difficult to determine. Seals are important predators of both large and small cod and could be playing a role in the non-recovery of cod stocks, but seal predation can not account for a large component of mortality in most areas and therefore, the total impact of seal predation cannot be determined. Little is known about the functional response of seals to changes in abundance of prey, other sources of mortality, or possible ecosystem effects such as competition for forage fish and positive feedback through seal predation on piscivorous fish.

Seven seal species occur regularly in the Barents Sea, Svalbard and the Greenland Sea areas. Three of these have adapted entirely to a life in the Arctic (walrus, bearded seals and ringed seals) while grey and harbour seals reside on the Norwegian and Murman coasts. None of these plays an ecological significant role. Two seal species in the area have been subject to a more large scale commercial exploitation: harp and hooded seals. Harp seals are the most numerous and ecologically the most important seals in the ecosystem, in particular in the Barents Sea. Barents Sea harp seals show opportunistic feeding patterns in that different species are consumed in different areas and at different times of the year. The bulk of the harp seal diet is comprised of relatively few species, in particular capelin, polar cod, herring, krill and pelagic amphipods. The

crustaceans appear to be particularly important during summer and autumn, whereas a switch from crustaceans to fish occurs in winter.

The total food consumption by ca. 2 million Barents Sea harp seals was estimated to be within a range of 2.69 - 3.96 million tonnes of biomass. Distribution of the harp seals' energetic requirements across a representative mix of prey species gave point estimates of 1.22 million tonnes crustaceans, 808,000 tonnes capelin, 605,000 tonnes polar cod, 212,000 tonnes herring and a mix of gadoids and other more Arctic fishes of circa 500,000 tonnes. A low capelin stock led to a switch in harp seal diet with increased consumption of other fish species, in particular polar cod, other gadoids and herring. Recent observations from satellite tagging experiments suggest that Greenland Sea and Barents Sea harp seals likely overlap in their feeding range during summer and autumn in the northern Barents Sea.

Seals have an increasing impact on fisheries in the Baltic Sea. The number of grey seals has increased in recent decade substantially and it has caused problems for coastal fisheries. One of the most affected fisheries is the whitefish gill net fisheries, which have severe seal problems. The herring gill net fishery is rapidly heading in the same direction.

Today, however the focus is on the cod fishery using bottom-set gill nets along the Swedish Baltic coast, where the level of damage is increasing drastically. From the county of Blekinge and north along the Swedish coast the fishermen reported that more than 50% of their net emptyings were disturbed by seals during 2007. Studies with marked fish have shown that also in this fishery there is large hidden damage that can't be directly observed by the fishermen. The economic consequences for the already hard-pressed inshore fishermen due to seal predation alone, involves a loss in income estimated at over € 5 million per annum.

Reducing interactions between seals and man at aquaculture sites is a global issue. However, it is only one aspect of a larger question: How do you exclude seals or other predators from areas of concern? A Seal Exclusion Zone (SEZ) is a geographical area where seals would be excluded for all or part of the year to reduce predation on an important aggregation of prey. Complete exclusion of seals from an area for any length of time is unlikely, if not impossible, in most marine areas and therefore a more realistic goal is to reduce the level of impact. The ability to reduce the number of seals in an area will become more difficult when moving from a small enclosed area such as a river to more open marine environments. There appear to be few methods that can be used to exclude seals from even small areas. A number of researchers have tried to relocate nuisance seals but generally, this has only provided a temporary reduction in numbers. Seals are often difficult to catch and relatively few animals can be dealt with at any one time. Acoustic deterrents have also been found to provide only temporary relief at best. Seals appear to habituate to the sound and may, in fact, attract individuals. Physical barriers have been

used successfully at some aquaculture sites and were used effectively in some rivers. However, in the later case, they were found to restrict fish movements, possibly increasing overall fish mortality. Lethal removals can be effective for small numbers of nuisance seals that habitually forage in small, well-defined areas such as rivers or aquaculture sites, but become less practical in larger, open, environments or in areas where the turnover rates of seals is high. Given the lack of success for most of the methods tried, the most effective ways to reduce seal predation in aquaculture sites appear to be to select areas where seals are not abundant, and to modify the design of holding tanks to limit the ability of seals to enter the fish holding areas.

The global warming has influenced the seasonal ice and snow cover in the Arctic areas. For example Arctic ringed seals, an important resource to native people and polar bears in the Arctic, depend on seasonal ice and snow cover. Tracking ringed seals with VHF and satellite-linked transmitters has demonstrated that increasingly early abandonment of subnivean lairs by ringed seals corresponded to advances in the timing of annual snow melt. Adaptive response by ringed seals to continuing reductions in ice and snow cover will depend on the rate of environmental change, selective constraints on earlier breeding, and the seals' population structure. Reduced snow and ice cover, coupled with restricted gene flow, suggest the potential for local extinctions with adverse impacts on polar bear and human populations.

Conservation is an integrated and important part of all wildlife management. Any management that cannot ensure the conservation of a renewable resource, a population or a species, has failed. The management of seals should not be different from management of other free ranging mammal species. The size and productivity of the population shall determine if this particular population can sustain any harvest. Regional or local traditions, public acceptance of hunting, utilization and usefulness of products, ecological and socio-economic aspects are all important factors to consider before a population can become subject to sustainable harvest. The overall principles for management of seals should include a definition of the management unit(s), clearly spelled out and prioritized management objectives, a set of defined strategies to achieve the management objectives, a program to monitor whether the management objectives are being met, and a feedback mechanism to improve the management strategies based on new data from the monitoring programme or from other data sources.

For example there are three separate but complimentary systems for management of seal populations in the North Atlantic Ocean—US/Canada, ICES and IUCN. Each of these has somewhat different management goals. The US system, mandated legislatively under the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA), is strongly oriented towards population recovery and conservation. Marine

mammal species must remain a “significant functioning element in the ecosystem of which they are a part.” Mandates under the Canadian Fisheries Act and Species-At-Risk Act are similar, although commercial harvesting is a viable management option in Canada while it is not in the US. The ICES/NAFO Harp and Hooded Seal Working Group (WGHARP) is providing advice to member states on sustainable harvests of these species.

In European Union, the Community measures are in place related to conservation and trade. All seal species benefit from protection under EU legislation, which includes the "Habitats" Directive. With reference to international trade, the EU has put the EU Wildlife Trade Regulations in place to implement the provisions of the Convention on International Trade in Endangered Species (CITES) in the EU. The Convention's objective is to ensure that trade only takes place if it does not threaten the survival of species of wild fauna and flora.

In response to a renewed interest by political authorities both in the Member states and the European Parliament, the public and major stakeholders, the European Commission undertook on 16 January 2007, in its reply to a Written Declaration by the European Parliament on banning seal products in the European Union, to make a full objective assessment of the animal welfare aspects of the killing and skinning of seals. Part of the assessment is conducted by a specially established Working Group of the European Food Safety Authority (EFSA). The overall assessment covers a critical review of existing and unbiased information, in particular scientific literature and studies on currently used killing methods, broad stakeholder consultations, as well as an assessment of the potential impact of a possible ban of products derived from seal species focussing in particular on socio-economic, trade and legal aspects. This action recognizes the significant level of public concern and is in line with the Commission's commitment to high animal welfare standards. Based on the results of this assessment, the Commission will then take a decision on any further action or measure it would propose at the Community level.

In the Baltic Sea area the contracting parties of The Baltic Marine Environment Protection Commission (HELCOM; The Helsinki Convention) has already agreed on a recommendation on sustainable management of seals in the Baltic. The recommendation concerns reference levels and management units for the three species concerned (grey seal, harbour seal and ringed seal). HELCOM has established a special “Seal group”, which has formed three teams working with issues related to population levels, health status and distribution. The management principles adopted by HELCOM, propose population reference levels as a fraction of carrying capacity. As present carrying capacity is unknown, the management program will require monitoring to detect whether the population is approaching carrying capacity. The power of detection will depend on data quality and the frequency of sampling.

In Canada, the Department of Fisheries and Oceans presents the science and the management activity supporting a biologically sustainable, well-managed and humane seal hunt in Canada. An overview of seal species found in Atlantic Canada focuses on the northwest Atlantic harp seal, which constitutes the majority of hunted animals, whose population levels are near the highest ever observed. Catch levels are determined according to the Precautionary Approach, with reference points and pre-determined management actions established for various population sizes, supporting the Department's Objective Based Fisheries Management regime for seals. The current regulatory framework, which has benefited from regular enhancements since the 1960's, and is designed to ensure a well-managed hunt, is described. Fisheries officers monitoring the hunt invest approximately double the coverage of other fisheries in particular sealing areas to ensure sealers comply with Canada's Marine Mammal Regulations. The presentation highlights the economic and social significance of sealing, representing one-third of the overall income to a number of rural communities in Atlantic Canada.

In the Baltic Sea there are currently three species of seals, but a fourth species, the harp seal, probably had a breeding population (on the basis of osteological finds of very young seals) in the Baltic for several millennia in the so-called Litorina period. The exact date of the disappearance of the species from the Baltic is not known, but harp seal finds become very scattered in the Iron Age indicating that a permanent population probably has not existed for at least ~2000 years. The factors behind the regional extinction remain unclear; climatic changes and hunting have been discussed in this context.

The start of seal conservation in the Baltic can largely be seen as a reaction to the drastic population decline culminating in the 1960s and 1970s. Baltic seals rapidly become one of the symbols of the need to protect this inbound sea area when it was in a scientifically sound way shown that seals had very serious problems in their reproductive health, and that environmental contaminants were probably causing these problems. Remaining national bounty systems for seals were abolished in the beginning of the 1970s. Hunting continued at a lower level but was then gradually stopped in most countries. In 1988, the regional marine environment protection commission, the HELCOM, agreed on a recommendation on seals that suggested a ban on all hunting of the three Baltic seal species.

From a conservation viewpoint, it is notable that the three southern subpopulations of the ringed seal are small or very small. The Gulf of Finland and South-western Finland (Archipelago Sea) populations number a few hundreds at maximum, and the Gulf of Riga possibly about 1000 seals. Also the eastern Baltic harbour seal population, genetically

distinct from the Kattegat-Skagerrak population, is small and has a very restricted distribution in the Baltic.

One of the basic messages from conservation biology is that small populations are vulnerable. For the southern ringed seal populations that possibly are not currently growing, any new threat factor would possibly lead to a negative growth rate. Such a threat factor is now emerging: global climate change. Climate models show that the average length of the ice winter is reduced from a level of close to 100 days to only about 20-40 days in the southern breeding areas of the ringed seal during this century. For an Arctic species depending on ice this is a drastic change. A major range decline is a possibility for the species as projected also by the recent Assessment of climate change for the Baltic Sea basin.

The hunting methods of marine mammals always create hot debate. The hunting methods vary considerably over the world. In general, seals are hunted both on ice, on dry land (islets, beach etc) and in the water. The method used depends largely on species, hunting traditions and regulations, time of the year and environmental conditions. Some seal species may be difficult to approach closely before they are rendered unconscious or dead and thus the stunning and killing devices must usually be designed to be applied to the animal from distance. Most weapons used for the hunting and killing of wild animals are designed to stun, bleed and kill the animal in one and the same operation by inflicting enough damage to vital organs to render the animal unconscious or/and dead instantly or very fast. The killing device has usually to be applied from distance and for marine mammals it is usually combined with some gears retrieve the animals. The following aspects should be taken into account when making the choice of weapons used for seals: Target species, environmental conditions, hunting traditions, availability of weapons and economy.

Sealing is an activity that is taking place in only a few countries. This activity is controversial even in some of the countries that have a sealing industry. In non sealing countries, if there is a public opinion on sealing it is most often against this industry. If the public opinion in a country does not favor sealing most politicians also tend to join this attitude and be against sealing in general or at least against commercial sealing. In countries without a sealing industry there is no down side for a politician to support the anti sealing position. Norway will continue sustainable harvest of marine mammals, which is based on scientific advice, precautionary approach and implementation of ecosystem approach.

In Greenland waters, there are five different species of seals, where the ringed seal and the harp seal are the two most important species in relation to socioeconomic value. In the Baffin Bay area where most of the ringed seals in Greenland are caught, the estimated population size is 1.2 million ringed seals. The northwest Atlantic harp seal population, which is the target of the hunt in both Canada and Greenland, is currently estimated to number about 5.5 million animals.

The skin is of great economic value, but the meat is also sold at local meat markets. In districts with sledge dogs, seal meat and blubber contribute significantly as food for sledge dogs. In the period from 1995 – 2005, the annual average catch of ringed, harp and hooded seal is about 168.000 seals per year, where the harvest of harp and ringed seals clearly dominates. There are minor catches of hooded seals, while the catch of bearded and harbour seal is very limited.

Over a 10-year period from 1995 - 2005, the annual average catch of ringed seals is about 82.000 seals, while the annual average catch for harp seals is about 79.000 seals. Greenland accounts for 21% of the harvest of harp seals in the period from 2000 to 2004 when compared to the catches in Canada, Norway and Russia. If the EU introduces a ban on the importation of sealskins from harp and hooded seals, even though exempting products from the traditional Inuit hunt, Greenland will suffer severely from such a ban.

In 1981, the international market was offering record high prices for seal pelts. In 1983, the European Community passed the "temporary" Seals Directive, banning the import of products from whitecoats (new-born harp seals) and bluebacks (year old and younger hooded seals). Immediately, a global collapse occurred in prices for all seal products. The only rationale given in the Seals Directive was concern over the "conservation status" of the harp and hooded seal populations; however, it was actually driven much more by the public concern over the morality of sealing, particularly the apparent cruelty in Canadian sealing practices, than whether harp and hooded seals were becoming endangered species.

Hunting seals is an essential component in the everyday life and culture in Greenland – providing a significant amount of income to families living in remote coastal communities. Harp, ringed and hooded seals are the three most important species - hunted in most settlements throughout the year. The income generated from the sale of sealskins is crucial for many families, since the money earned from sealing is invested in new hunting equipment, fishing gear and maintenance. Greenland local communities suffered severely from the 1983 EU-Directive, and it has taken almost two decades to re-establish an economically viable production of sealskins.

Presently the commercial exploitation of seals does have a "credibility" problem because of past mismanagement of commercial hunts of marine mammals, particularly whales. It is therefore up to the marketers to demonstrate that their product is acceptable, and the author concluded that international standards were an effective way to achieve this.

In Norway, a world wide well known operator, GC Rieber Skin AS has been 125 years on the global market. GC Rieber Skin AS was founded in 1879 by Gottlieb Christian Rieber and are to day still in the family with 4th generation as CEO. More than 20 % of the company is owned by GC Rieber Charity Foundation with contribution to public

welfare with focus on social welfare, culture and research. Vertical integration from "the edge of the ice to the edge of the catwalk" has been the main reason for continuous adjustments over the years. In Rieber Skin AS, the sealing industry is considered environmentally-sustainable, humane and well managed through close cooperation between the local governments and the industry. Harvesting from renewable resources, process and product development with fashion designers has given seal skin a niche on the global skin market.

In Finland there is a new "Seal product project" in Kvarken area, where grey seal are exploited and products from skin to oil produced. The project started in 2001 and now Sweden, Finland and Norway are involved. The main aim of the project is to promote sustainable management of the resource, seek resolutions for valuable resource exploitation and promote production of various seal products such as oil, meat, pelt and bone. The recent activities include cooperation with experienced designers to create stylish products, including several lines of clothing and other skin products including pillows, chairs and hunting equipment, chefs to create new seal meat products and developing new recipes and recipe book, to produce oil, as paint, shoe polish, for tanning and medicine and bones for jewelry. Presently the project involves ca. 100 hunters along the west coast of Finland, 100 in the southern Baltic and a further 100 hunters in Sweden. Future activities within the project framework will include the production of a hunter education DVD, development of products using seal meat and oil, and development of seal leather products. Like many marine products, seal meat contains some contaminants, and there are recommended maximum consumption levels because of this.

Marine mammal oil products have shown to have health care effects. Intake of seal and whale oil has been shown to be effective in reducing the reactivity of blood cells and reducing the activation of coagulation in a favorable, non thrombotic direction. This property may be the explanation of the low incidence of myocardial infarction in the Greenlandic Inuit population. Report from NAMMCO organized workshop indicate that there are beneficial effects of supplementing an ordinary diet with marine mammal oils, both for the general population and for certain patient groups. However, many of these beneficial effects should be better documented in larger placebo controlled double blind studies conducted and analyzed according to strict methodological rules.

Many of the beneficial properties of seal and whale oil must be related to the high content of ω -3 fatty acids in these oils. However, some of the beneficial properties could be related to antioxidants and other substances which are removed or destroyed during the refining operations. It is still uncertain whether harp seal oil and minke whale oil have properties better than fish oils, e.g. cod liver oil, mainly because the two types of oils have not been used in the same investigations. There are many reports, both

old (back to the factory ship whaling period) and new, which claim beneficial effects on skin diseases (especially eczema and sore skin) of topical applications utilizing raw whale oil.

At the end of the conference, a panel discussion was organized with several themes and questions to stimulate discussion and debate among the panelists and audience. The following topics and questions were discussed during the Theme Session “Sealing the Future”:

- Scientific basis for managing sealing and seal/fisheries interactions
- Is harvesting a surplus the only definition of a sustainable harvest?
- How certain do we need to be to manage seals in relation to their role in the ecosystem, in particular in relation to interactions with fisheries?
- Conservation and management issues and approaches
- How to the population reference levels used in the ICES/NAFO and Canadian harp seal management procedures differ from management goals?
- International trade and public perceptions
- To what extent should trade measures be used as a management tool for seals?

The panel was composed of:

Chairperson: Kate Sanderson, NAMMCO

The panellists:

Tom Fowler, Canada

Amalie Jessen, Greenland

Dorotee Convens-Billerbeck, European Commission

Madeleine Nyman, Finland

Per Hamnes, Norway

Halvard Johansen, Norway

Bernie McConnell, United Kingdom

Sven-Gunnar Lunneryd, Sweden

Garry Stenson, Canada

Jari Luukkonen, Finland

Detailed output of the discussion is given in Chapter 5 of this report.

1. Status and ecosystem effects of seal stocks in the Baltic Sea and the North Atlantic

Chair: Eero Aro, Finland

1.1 Eero Helle (Finland):

Grey seal and ringed seal abundance and distribution changes in the Baltic Sea. Where are we now and where are we going?

The two most abundant seal species in the Baltic Sea, the grey seal *Halichoerus grypus* and the ringed seal *Phoca hispida*, have experienced remarkable changes during the most recent decades. The grey seal, in particular, has increased in numbers to such an extent that the high-priority conservation rarity has become an utilizable resource, which also have increased interactions with and cause damage to fisheries.

Both species experienced the lowest numbers around the early 1980's. Since then, the grey seal has increased from a total population of ca. 3,000 to more than 20,000 counted specimens in 2006. In the same period, the ringed seal population has behaved differently. The majority of the Baltic population in the Gulf of Bothnia has increased from ca. 2,000 to more than 4,500 counted specimens, but data on population development in other areas does not allow to conclude on any trends reliably.

In the long run, the Baltic grey and ringed seal numbers have been strongly affected by heavy exploitation and, more recently, reproductive disorders. The first mentioned reason has not existed any more for at least 30 – 40 years. Reproductive disorders have hit the grey seal less hardly than the ringed seal from the very beginning in the 1960's-1970's. In the most recent material from 2000-2006 (n=328), both ovulation and pregnancy frequencies among sexually mature grey seal females were high and undisturbed, and only one per cent had leiomyomas as pathological changes. The frequency of uterine occlusion in the ringed seal has decreased from 60% in the late 1970's to less than 20% during the most recent 12 years in mature females in the Bothnian Bay. As females with occlusions have mostly been over 20 years of age, the occlusion pathology seems to continue to disappear from the population.

The distribution area of both species in the Baltic diminished in the course of the population decline in the 1900's. The occurrence of grey and ringed seals during population lows in the 1970's-1980's indicated

the optimal habitats in the Baltic area. For the grey seal they are archipelagoes surrounding the northernmost Baltic proper in Finland, Sweden and Estonia. Optimal areas for the ringed seal are those with the most regular annual ice cover, namely the Bothnian Bay, Gulf of Riga, eastern Gulf of Finland and southwestern archipelago of Finland.

For the near future, both grey and ringed seal seem to be increasing in numbers, as mortality through hunting/killing is strictly regulated and reproductive disorders are none for the grey seal and disappearing gradually for the ringed seal. In concord with this increase both species will enlarge their area of distribution as far as habitats are still suitable for them. As ecological carrying capacity does not seem to be restricting the growth of the populations, man may want to regulate the numbers to some extent basing on economical and social sustainability. This is a crucial point to be solved wisely in managing the Baltic seal populations. National and international management plans are important tools in this work.

In more distant future, global warming and diminishing ice coverage will have a negative affect on both species. The ringed seal, being originally an arctic species, will be hit more severely, as it is adapted to breed in lairs in snow drifts on ice. At least the suitable habitat most probably diminishes in coverage. The grey seal breeds already to-day both on ice and on land. With the diminishing ice cover grey seals may turn land-breeders more and more. This may affect population dynamics, as the breeding success is known to be better on ice than on land. – More generally, there are many other potential risks seals may be facing in the Baltic Sea in warming climate, as the whole ecosystem may experience large-scale changes.

1.1.1 Discussion

The ice cover of the Baltic and Gulf of Bothnia is tremendously variable from year to year, and varies up to 5x annually in extent. This tends to mask longer term trends in ice cover. While the trend in ice extent is not so obvious as in some other areas, such as the Arctic Ocean, there has been an apparent decrease over the past 20 years. Fortunately excellent data on ice cover and extent is available for the area.

It is obvious that the huge population declines in both grey and ringed seals early in the 20th century were due to heavy overexploitation. There was a policy to reduce seal populations at the time and the hunt was heavily subsidized through bounty payments. However the population failed to recover even after hunting ceased, probably due to reproductive failure as mentioned in the talk. More recently the situation has improved, particularly for grey seals, and both species are recovering. This is due to better reproductive success and low and managed harvests.

While oil spills are a risk for seals, they are probably not sensitive to minor spills in the short term as they can easily avoid them. However chronic exposure to oil and other contaminants can produce long term health problems including reproductive failure.

1.2 Mike Hamill (Canada): Population dynamics of harp, hood and grey seals in the North Atlantic, uncertainties in estimations and predictions

Renewable resource exploitation relies on robust scientific assessments and a clear management framework to ensure the longer term sustainability of the resource. The scientific assessments attempt to predict changes in the resource by incorporating information on catches, estimates of recruitment, and abundance indices into a population model. Because the information is often incomplete and estimated model parameters are subject to natural variability, the resulting advice must account for the uncertainty associated with the assessment. Failure to recognize the importance of this uncertainty can lead to unexpected consequences and overexploitation. Under the Precautionary Approach to management (which has been adopted by Canada and is applied to the management of Atlantic seals), this uncertainty must be considered and cannot be used to delay conservation measures

Harp, hood and grey seals are common in the North Atlantic. Harp and hood seals are seasonal migrants, spending the summer in Arctic waters of Davis Strait and off southeast Greenland. Both species migrate to northern Atlantic waters during late fall; breeding occurs in March on the drifting pack ice off eastern Canada and in the Gulf of St. Lawrence. Grey seals disperse from major breeding sites on Sable Island and in the Gulf of St. Lawrence to summer along the Atlantic coast and throughout the Gulf. Harp seal abundance increased from a low of around 1.8 million animals in the early 1970s to over 5 million animals by the mid-1990s, since then the population has changed little. Grey seals also increased rapidly from around 20,000 animals in eastern Canada in the 1970s to over 250,000 animals today. Although growth has been exponential, the rate of increase, particularly on the main colony at Sable Island appears to be slowing. Hooded seals have shown little change in population size since the 1970s, with a total population estimated to be just under 600,000 in 2005.

All three species are monitored using aerial surveys, completed once every 4-5 years. These surveys provide an estimate of the number of pups that are present in the breeding areas. A population model that incorporates information on reproductive rates, reported removals, as well as estimates of non-reported removals is used to develop an estimate of total

population size. There is considerable uncertainty associated with inputs to the model, which must be considered. Also, uncertainty associated with future conditions, particularly environmental conditions, mean that a conservative approach must be adopted when making recommendations to management.

1.2.1 Discussion

The relative ability of harp and grey seals to adapt to lower ice conditions differs. In low ice years harp seals have been observed to pup on unsuitable, unstable ice or even on beaches, but this usually results in high pup mortality. Grey seal pupping behaviour appears to be much more plastic and the grey seal can shift readily between land and ice habitats.

The relatively high rate of struck and lost (50%) applied to Greenlandic and Canadian open water harp seal hunts is derived from hunt observations in Canadian waters. While better data are needed, population estimates are relatively insensitive to this factor.

1.3 Tero Härkönen (Sweden): Seals in the Baltic ecosystem. Carrying capacity and predator-prey relationships. What is the level of knowledge?

After decades of steady exponential growth, many marine mammal populations show hampered and even decreasing trends. These dramatic changes in population growth rates often come with surprise, and there are not always apparent explanations for the changes even in retrospective. It is of vital interest for conservation to develop early-warning criteria to be able to detect signs of major changes in the status of populations, but also for the general understanding of the ecological mechanisms behind such changes.

We develop a detailed age structured model for density dependent population growth to study how the population dynamics changes as the population size approach carrying capacity. We compare the dynamics with that of an unstructured model to show the importance of incorporating structure in analyses of population dynamics and extinction risk in long-lived mammals.

We show that density dependence affects the power of detecting trends in population growth, and it is really only during the exponential growth phase that population trends are significant. However, it is possible to detect a trend in decreasing population growth as density dependence starts to set in, though a measurement window of about 15-20 years. The power is highest during intermediate density dependence and de-

creases as the population closes in on its K and the variance in resources that governs K is transferred into the population.

The changes in the proportion of adults to sub-adults that arise during population growth under density dependence can complement counts and be used in the field as indicators of density dependence. However, a window of 20-25 years of measurements is required for significant power. Still, for historical data that lack counts, such as harvest records, structure analysis may provide information on potential population trends. Density dependent sub-adult or adult survival produces no obvious structural patterns.

Risk assessment, comparing our structured model with an unstructured model with the same exponential growth rate and K reveals that the unstructured model overestimates risks of reaching below a set limit. We believe this to be a result of high adult survival buffering some of the environmental variability in population growth caused by high variability in fertility and pup survival. This highlights the importance of structure in analyses of long-lived mammals, in particular for management purposes.

We develop a more realistic model for and investigate how density dependence can be detected in time series of population counts, how many years of sampling are required and suggest methods for acquiring these data.

1.3.1 Discussion

Monitoring of a population's status relative to carrying capacity requires long time series of intensive data collection, particularly on pup production. While it may not be realistic for some jurisdictions to mount this sort of effort, the assessment of a population's true conservation status does require some knowledge of its number relative to K .

1.4 Garry Stenson (Canada):

Predator-prey impacts of seals on commercial fisheries.
The complexities, uncertainties and inconsistencies in the current debate.

The impact of marine mammals, particularly seals, on the recovery of depleted fish stocks is a controversial issue and the focus of significant research efforts. Three species of seals are considered important predators in the northwest Atlantic, harp, hooded and grey seals. Harp and hooded seals are seasonal migrants that have shown little or no increase in abundance over the past decade. Grey seals are residents of temperate waters that, after a number of decades of exponential growth, are beginning to show signs of density dependent reductions in growth rates. Consumption of important prey species by seals in Atlantic Canada has been estimated

using bioenergetics models. Harp seals are important predators off the eastern coast of Newfoundland and in the northern Gulf of St. Lawrence while grey seals are the most important pinniped predator in the southern Gulf and on the Scotian Shelf. Hooded seals feed primarily in the Labrador shelf, Grand Banks and Flemish Cap areas. Recent advances in methods of estimating diet have provided new insights into the importance of individual prey species that will require new estimates of consumption.

A number of studies have attempted to determine the impact of seals on fish stocks in the northwest Atlantic, particularly the impact of harp and/or grey seals on Atlantic cod. In general, these studies have indicated that although seals consume substantial amounts of commercial fish species and important forage species, the impact of these removals on the current fish stocks is difficult to determine. Seals are important predators of both large and small cod and could be playing a role in the non-recovery of cod stocks, but seal predation can not account for a large component of mortality in most areas and therefore, the total impact of seal predation cannot be determined. Often, estimates of age specific cod consumption by seals are inconsistent with the high mortality observed among older age groups. Little is known about the functional response of seals to changes in abundance of prey, other sources of mortality, or possible ecosystem effects such as competition for forage fish and positive feedback through seal predation on piscivorous fish.

1.4.1 Discussion

Even an apparently high consumption by a predator of a given prey species does not constitute evidence of impact on the prey, as the consumption must be high relative to that of other predators and substantial relative to the productivity of the prey species.

While predators may switch prey species in response to prey abundance, some predators have a high preference for certain prey species, and may therefore have a greater impact on these species as they will continue consuming them even at low prey abundance levels.

Estimates of consumption typically have high uncertainty because every parameter used in the estimation (e.g. diet, energy use, predator abundance) has an associated variance. Sensitivity analyses are useful in determining which parameters have a greatest effect on the estimate of consumption and thus where more data are needed.

1.5 Brendan P. Kelly (USA): Ice seal population structure and environmental change.

Arctic ringed seals, an important resource to Native people and polar bears in the Arctic, depend on seasonal ice and snow cover. In partnership with Native hunters in Alaska and Canada, we are investigating the seals' population structure and the impacts of reduced ice and snow cover. Ringed seals tracked with VHF and satellite-linked transmitters maintained small home ranges (rarely exceeding 1 km²) in the winter and spring while ranging over thousands of kilometers during summer and fall. In successive years, adult seals returned to the same winter/spring home ranges. Tracking also demonstrated that increasingly early abandonment of subnivean lairs by ringed seals corresponded to advances in the timing of annual snow melt. Adaptive response by ringed seals to continuing reductions in ice and snow cover will depend on the rate of environmental change, selective constraints on earlier breeding, and the seals' population structure. We obtained DNA from shed skin samples collected from breeding sites. Analysis of 8 micro satellite markers collected at three sites suggested a high degree of population structuring with as many as 90% of the seals returning to their own natal sites to breed. The power of the analysis will be strengthened by analysis of additional micro satellite and mtDNA markers as well as by sampling additional sites. Additional samples have been collected in Alaska (Chukchi and Beaufort sea coasts), Canada (Beaufort Sea), and Finland (Baltic Sea and Lake Saimaa). Those samples have been supplemented by an additional 1500 samples collected in the breeding season - primarily in the Bering, Chukchi, and Beaufort seas - and archived at the University of Alaska Museum of the North. Reduced snow and ice cover, coupled with restricted gene flow, suggest the potential for local extinctions with adverse impacts on polar bear and human populations.

1.5.1 Discussion

The site fidelity observed in adult ringed seals does suggest that changes in ice cover and reductions in breeding habitat in due to climate change will result in population reductions and local extinctions in some areas. However the reduction in the extent of very thick multi-year ice may also open up habitat for ringed seals, so the overall effect may be mixed.

Industrial activity is increasing in Arctic waterways. Ringed seals have exhibited short term responses to noise and other activities, but the long term effects on the population are not known.

1.6 Tore Haug (Norway):

Seals in the Barents Sea, Svalbard and the Greenland Sea.
The effects of an abundant predator in a relatively simple ecosystem. Big changes from small causes.

Seven seal species occurs regularly in the areas. Three of these have adapted entirely to a life in the Arctic (walrus, bearded seals and ringed seals) while grey and harbour seals reside on the Norwegian and Murman coasts. None of these plays an ecological significant role. Two seal species in the area have been subject to a more large scale commercial exploitation: harp and hooded seals. Harp seals are the most numerous and ecologically the most important seals in the ecosystem, in particular in the Barents Sea. Barents Sea harp seals show opportunistic feeding patterns in that different species are consumed in different areas and at different times of the year. The bulk of the harp seal diet is comprised of relatively few species, in particular capelin, polar cod, herring, krill and pelagic amphipods. The crustaceans appear to be particular important during summer and autumn, whereas a switch from crustaceans to fish occurs in winter. The total food consumption by *ca.* 2 million Barents Sea harp seals was estimated to be within a range of 2.69 - 3.96 million tonnes of biomass. Distribution of the harp seals' energetic requirements across a representative mix of prey species gave point estimates of 1.22 million tonnes crustaceans, 808,000 tonnes capelin, 605,000 tonnes polar cod, 212,000 tonnes herring and a mix of gadoids and other more Arctic fishes of circa 500,000 tonnes. A low capelin stock led to a switch in harp seal diet with increased consumption of other fish species, in particular polar cod, other gadoids and herring. Recent observations from satellite tagging experiments suggest that Greenland Sea and Barents Sea harp seals likely overlap in their feeding range during summer and autumn in the northern Barents Sea. This means an additional pressure on the Barents Sea resources. Ecosystem changes may affect marine mammal populations, *e.g.*, through changes in food or habitat availability. The winter/spring harp seal invasions to coastal areas of North Norway in the 1980s may serve as a useful example. Food shortage, particularly of the three important prey species capelin, polar cod and herring, likely caused the coastal invasions. It has been suggested that there may be a simple density dependent relationship between population size and age at maturity in harp seals (more seals, less food, slower reproduction) – in the Barents Sea population the mean age at maturity has increased from *c.* 5.5 years in the early 1960s to 8.2 year in the early 1990s.

1.6.1 Discussion

Extreme variations in the stock size of capelin, which are an important prey species for harp seals, occur naturally but may also be related to fisheries. The size of the capelin stock is also important for herring recruitment, as adult capelin consume herring larvae.

1.7 Kjell Tormod Nilssen (Norway): Status of harbour seal stocks in the Baltic and the North Atlantic.

In the North Atlantic, harbour seals are distributed along the east coasts of US and Canada, southwest Greenland, Iceland, Ireland and UK, including the Orkneys and Shetland, northern coast of France, Wadden Sea, southern Scandinavia and Baltic, including Kalmar Sund, the Norwegian coast, including Svalbard, and the Kola coast in Russia. The biology of the harbour seal lead to the expectation of a complex stock structure due to coastal distribution, breeding in discrete colonies, high degree of philopatry, short breeding season, lack of large seasonal migrations, relatively sedentary nature. Preliminary genetic studies suggest at least 14 stocks of harbour seals in the North Atlantic. Abundance estimates of harbour seals are obtained mainly by using aerial photo surveys and visual counts on their moulting sites. Such counts only provide an index of the total population, because some seals would be in the water and therefore not counted. Other methods have in some areas been employed to derive correction factors to convert the counts to estimates of total abundance. The harbor seal stock along the East US coast has increased during the last 20 years. Most of the other stocks have been reduced due to the phocine distemper virus (PDV) outbreaks in 1988 and 2002, human impact (hunting and bycatch), recruitment failure due to increased competition with other species (grey seals) and predation by sharks. The status for some stocks are unknown due to lack of monitoring. In the Faroes the harbor seal is exterminated as a breeding species. In Greenland the harbour seal is severely depleted. In Kalmar Sund in the Baltic the species is depleted but increasing.

Management plans for harbour seals are important for conservation of the species, and should include monitoring, recordings of seals taken by hunters and as bycatch in fishery, genetic studies in order to reveal structure on a smaller scale and population modeling. Studies on the role of the harbour seal in the ecosystem, including the harbor seals prey consumption compared to the fish takes in local fisheries, are important in order to document the nature and magnitude of problematic interactions between seals and fisheries.

1.7.1 Discussion

Land breeding seals, such as harbour and grey seals, are vulnerable to hunting and disturbance. This explains the extirpation of the Faroese population and the severe depletions in other areas. Grey seals have also been extirpated in the Wadden Sea and Kattegat. These species require special conservation measures to preserve their breeding and haul-out habitats.

2. Seals and society-conservation, fisheries and sustainable use

Chair: Arne Bjørge, Norway

2.1 Antti Halkka (Finland):

Historical background for conservation and preservation and critical points in the Baltic Sea

The Baltic Sea has been shared by people and seals from the emergence of the Baltic basin more than 10,000 years ago. There are currently three species of seals, but a fourth species, the harp seal, probably had a breeding population (on the basis of osteological finds of very young seals) in the Baltic for several millennia in the so-called Litorina period. The exact date of the disappearance of the species from the Baltic is not known, but harp seal finds become very scattered in the Iron Age indicating that a permanent population probably has not existed for at least ~2000 years. The factors behind the regional extinction remain unclear; climatic changes and hunting have been discussed in this context.

The start of seal conservation in the Baltic can largely be seen as a reaction to the drastic population decline culminating in the 1960s and 1970s, which luckily coincided with the start of the modern conservation movement. Baltic seals rapidly become one of the symbols of the need to protect this inbound sea area when it was in a scientifically sound way shown that seals had very serious problems in their reproductive health, and that environmental contaminants were probably causing these problems. Remaining national bounty systems for seals were abolished in the beginning of the 1970s. Hunting continued at a lower level but was then gradually stopped in most countries. In 1988, the regional marine environment protection commission, the HELCOM, agreed on a recommendation on seals that suggested a ban on all hunting of the three Baltic seal species.

Bans on hunting and a reduced burden of contaminants (also resulting from national and international actions) led to the gradual recovery of Baltic seal populations we are now seeing. The more than tenfold decline in the 1900s, however, also led to notable range contractions. The grey seal has not returned to the traditional distribution area in the southern Baltic Sea. The former semi-continuous distribution of the Baltic ringed seal population is fragmented to four breeding subpopulations. These populations are not genetically separated but they are probably demographically distinct as has been shown with satellite tagging. From a con-

servation viewpoint, it is notable that the three southern subpopulations of the ringed seal are small or very small. The Gulf of Finland and South-western Finland (Archipelago Sea) populations number a few hundreds at maximum, and the Gulf of Riga possibly about 1000 seals. A further cause of concern is that, as the ICES WGMME has pointed out, no positive growth rate has been shown in these ringed seal populations. Also the eastern Baltic harbour seal population, genetically distinct from the Kattegat-Skagerrak population, is small and has a very restricted distribution in the Baltic.

One of the basic messages from conservation biology is that small populations are vulnerable. For the southern ringed seal populations that possibly are not currently growing, any new threat factor would possibly lead to a negative growth rate. Such a threat factor is now emerging: global climate change. Climate models show that the average length of the ice winter is reduced from a level of close to 100 days to only about 20-40 days in the southern breeding areas of the ringed seal during this century. For an Arctic species depending on ice this is a drastic change. A major range decline is a possibility for the species as projected also by the recent Assessment of climate change for the Baltic Sea basin. Global action is needed for a global cause. Regionally, it would be elementary to identify and eliminate any factors currently negatively affecting the ringed seal populations of the Baltic. Hunting of ringed seals should remain completely banned. If there is a lesson to be learnt from the history of Baltic seal protection, it is to be very restrictive in hunting and to act rapidly in conservation. Both conservation and management should be coordinated internationally as agreed by all contracting parties of HELCOM. The new (2006) HELCOM seal recommendation is a compromise between seal protection and damage mitigation. It may form a good basis for management as it flexibly warrants different management options according to the conservation status of a species. It is clear that for none of the Baltic species, a safe level has been reached yet; WWF thinks that all Baltic Sea seal species are only in the beginning of the path towards the population level and distribution objectives that all Baltic Sea countries agreed on in the HELCOM seal recommendation. This is true also for the grey seal: In the southern parts of the Baltic Sea, the recovery of the species is dependent on spill-over from northern part of the Baltic-wide management unit. We hope that the newly formed HELCOM seal group gets the resources and mandate to harmonise conservation and management in the entire Baltic. Also the role of the EU is fundamental now that 8 of the 9 Baltic coastal countries are member states.

2.1.1 Discussion

Ringed seal breeding on land has been observed in the Baltic, but the mortality of pups is likely high due to predation and exposure.

2.2 Sven-Gunnar Lunneryd (Sweden): Seals in the Baltic in relation to fisheries

Seal stocks in the Baltic Sea plummeted during the 20th century as a result of severe hunting pressure and widespread environmental pollution. As seal numbers have increased, severe problems have arisen for coastal fisheries in this region, especially with the grey seal. One of the most affected fishery is the whitefish gill net fishery which have severe seal problems. The herring gill net fishery is rapidly heading in the same direction.

Fortunately a partial solution to the seal problem has been found in the case of the fixed trap fisheries for salmon and whitefish, in the form of the so-called push-up trap, which was originally described as seal-safe. However, after a successful first few seasons, even this counter-measure is becoming increasingly vulnerable to seal damage as the seals invent new ways of getting at the catch. Video recording inside the traps revealed that the seals acted like a goal-keeper and caught the fish without leaving any traces of damaged fish. Further modifications are needed to keep them away.

Today however the focus is on the cod fishery using bottom-set gill nets along the Swedish Baltic coast, where the level of damage is increasing drastically. From the county of Blekinge and north along the Swedish coast the fishermen reported that more than 50% of their net emptyings were disturbed by seals during 2007. Studies with marked fish have shown that also in this fishery there is large hidden damage that can't be directly observed by the fishermen.

The economic consequences for the already hard-pressed inshore fishermen, due to seal predation alone, involves a loss in income estimated at over €5 million per annum.

The question we are facing is just how large we want the Baltic Sea seal populations to be, and what price are we prepared to pay for this in terms of the survival of the region's coastal fisheries?

Bycatches of seals are a negative effect of the commercial fishery. The magnitude of the bycatches are in the order of several hundred grey seals and a lesser number of ringed seals yearly, in the Swedish fishery only. For the fishing community the bycatches are an animal welfare issue which is of concern to the public, but also a direct problem as it involves damaged gear, lost catches and fishing time wasted. A collaboration between the fishing community and the scientific community, is the only satisfactory way to reduce the by-catch problem.

2.2.1 Discussion

In Sweden fishermen receive compensation for damage and losses due to seals. However the fishermen argue that it does not cover their losses, and

it is certain that it does not cover hidden losses (fish removed from gear leaving no trace) due to seals. The compensation program is necessary for the survival of the coastal fishery.

There is severe frustration among fishermen over the issues surrounding seal depredation. However public opinion in general favours the growth and spread of the seal population in the Baltic, so mitigation of the problem through gear development and compensation programs may be the only solution. One promising mitigation measure is the selective removal of “problem” seals, *i.e.* those that specialize on depredating fishing gear. However the long term effectiveness of this approach remains to be assessed.

2.3 Garry Stenson (Canada): Seals, fisheries and aquaculture in North Atlantic

Reducing interactions between seals and man at aquaculture sites is a global issue. However, it is only one aspect of a larger question: How do you exclude seals or other predators from areas of concern? A Seal Exclusion Zone (SEZ) is a geographical area where seals would be excluded for all or part of the year to reduce predation on an important aggregation of prey. In April 2004, The Department of Fisheries and Oceans, Canada held a workshop to review available data on the feasibility of SEZs. Participants included scientists from Canada, Norway and the United States.

Complete exclusion of seals from an area for any length of time is unlikely, if not impossible, in most marine areas and therefore a more realistic goal is to reduce the level of impact. The ability to reduce the number of seals in an area will become more difficult when moving from a small enclosed area such as a river to more open marine environments. Before setting up a SEZ, there should be clearly defined objectives and project design. Expected outcomes should be estimated and methods of monitoring effectiveness, with specific performance measures, identified. Plans should also be put into place for continued monitoring of the area to determine if the actions were effective in the long term or simply transient in nature. The actions used to exclude (or reduce) seals in an area should be carried out in a humane, publicly acceptable, manner. They must be able to be managed effectively and provide a significant benefit without incurring an unreasonably high cost. Establishing a SEZ should not pose a conservation risk to the predator. If it does, it would be considered a cull and should meet additional criteria.

Before identifying an appropriate SEZ, both in terms of geographical area and time, it is necessary to understand the distribution, movements and population dynamics of the prey and predator populations in order to identify areas of co-occurrence. The ecological importance of the area to both predator and prey populations will have an impact on the need for

excluding seals and the methods used. In the case of aquaculture sites, the location may be well defined, but a clear understanding of the number of seals that use the area and their movements in and out of the area are needed before it is possible to evaluate the potential efficacy of the proposed actions. There should be a reasonable expectation that a reduction in seals will result in a significant benefit to the prey population.

There appear to be few methods that can be used to exclude seals from even small areas, let alone larger areas without land boundaries. A number of researchers have tried to relocate nuisance seals but generally, this has only provided a temporary reduction in numbers. Seals are often difficult to catch and relatively few animals can be dealt with at any one time. They can swim long distances and when moved, often return to the original location within day or months. Acoustic deterrents have also been found to provide only temporary relief at best. Seals appear to habituate to the sound and may, in fact, attract individuals. Acoustic deterrent devices can also harm non-target species such as harbour porpoise. Physical barriers have been used successfully at some aquaculture sites and were used effectively in some rivers. However, in the later case, they were found to restrict fish movements, possibly increasing overall fish mortality. Barriers are not feasible in larger areas. The high capital costs associate with the construction and maintenance of barriers also limit the usefulness of this method. Lethal removals can be effective for small numbers of nuisance seals that habitually forage in small, well-defined areas such as rivers or aquaculture sites, but become less practical in larger, open, environments or in areas where the turnover rates of seals is high. Canada does issue permits to kill 'nuisance' seals in situations where other methods are not effective. However, their use is very limited.

To investigate the effectiveness and feasibility of using a SEZ to protect Atlantic cod from seal predation, an experimental SEZ was established in Smith Sound, Newfoundland, Canada. The objective of the study was to determine if the number of seals in the area can be reduced significantly through hunting and maintained once the program ended. Although seals were reported to be abundant, relatively few seals were seen in the area during surveys or reported by hunters. Generally, hunting pressure was insufficient to result in a measurable reduction in the number of seals observed. Hunters could only work during daylight hours and although they attempted to be active on all days, hunters were on the water less than 50% of the days due to poor weather. The movement of seals into and out of the area indicated that, even if seals could be reduced in the very short term, hunting was unlikely to be effective over the longer term.

Given the lack of success for most of the methods tried, the most effective ways to reduce seal predation in aquaculture sites appear to be to select areas where seals are not abundant, and to modify the design of holding tanks to limit the ability of seals to enter the fish holding areas.

The complete report from the Seal Exclusion Zone Workshop can be found at:

http://www.dfo-mpo.gc.ca/csas/Csas/proceedings/2004/PRO2004_022_E.pdf

2.3.1 Discussion

The removal of “problem” seals has been tried on a small scale in the Baltic, where it has been successful in the short term. However it is labour intensive and most effective with more sedentary species such as harbour seals.

Interactions tend to be most frequent in areas nearby land haulouts, so an effective mitigation measure would be to dissuade seals from hauling out near fishery or aquaculture operations or, alternatively, to preclude these activities near land haulouts.

2.4 Amalie Jessen (Greenland) : Sustainable sealing in Greenland

Five different species of seals occur in Greenlandic waters, where the ringed seal and the harp seal are the two most important species in relation to socioeconomic value. In the Baffin Bay area where most of the ringed seals in Greenland are caught, the estimated population size is 1.2 million ringed seals. The northwest Atlantic harp seal population, which is the target of the hunt in both Canada and Greenland, is currently estimated to number about 5.5 million animals.

Different hunting methods are used in the Greenlandic seal hunt, according to seasonality and region. Open water hunt is by far the most applied method, but also netting is used in the northern districts, especially during the dark winter months where the use of rifles is impossible due the lack of daylight. Struck and lost on harp seals in the open water hunt is a problem during springtime when the harp seals arrive from Canada – a time where they are very lean. A questionnaire survey conducted in 2006 revealed, that for full time hunters the struck and lost rate is about 20% and for spare time hunters it is about 25%. Almost all parts from the seal are being used.

The skin is of great economic value, but the meat is also sold a local meat markets. In districts with sledge dogs, seal meat and blubber contribute significantly as food for sledge dogs. In the period from 1995 – 2005, the annual average catch of ringed, harp and hooded seal is about 168.000 seals per year, where the harvest of harp and ringed seals clearly dominates. There are minor catches of hooded seals, while the catch of bearded and harbour seal is very limited.

Over a 10-year period from 1995 - 2005, the annual average catch of ringed seals is about 82.000 seals, while the annual average catch for harp

seals is about 79.000 seals. Greenland accounts for 21% of the harvest of harp seals in the period from 2000 to 2004 when compared to the catches in Canada, Norway and Russia. If the EU introduces a ban on the importation of sealskins from harp and hooded seals, even though exempting products from the traditional Inuit hunt, Greenland will again suffer severely from such a ban.

2.5 Halvard P. Johansen (Norway): Sealing in Norway, critical points and interactions

Sealing is an activity that is taking place in only a few countries. This activity is controversial even in some of the countries that have a sealing industry. In non sealing countries, if there is a public opinion on sealing it is most often against this industry. If the public opinion in a country does not favour sealing most politicians also tend to join this attitude and be against sealing in general or at least against commercial sealing. In countries without a sealing industry there is no down side for a politician to support the anti sealing position. We have seen and continue to see political initiatives in many countries to stop sealing by establishing trade barriers and thus eliminate the market for the seal products. This is the background for the sealing industry in the countries bordering the Arctic.

In my intervention I will give a brief exposé of the situation in the Norwegian sealing industry, and how it forms part of our general fisheries policy. I will discuss critical points and interactions both as part of an ecosystem approach to management and as part of the political setting around the sealing activities.

The most critical point in the discussion of sealing is that we try and understanding each other. We have to recognize that we have different experiences and different opinions because of the different environment that we are living in. What is natural to me, may not be that obvious to a person with less direct links to the use of the marine resources. I will maintain that it is responsible to use the surplus of what Mother Nature produces. In my mind it is also good environmental policy. But I respect that there are other views. What I do not accept is that those views are to be imposed on me regardless of their validity.

Other critical points are the need for further research in order to establish the interrelationship between the different species under the water surface. This is mandatory in order to improve the management decisions. Such studies could also make it easier to have a less emotionally charged debate about a controversial issue like sealing.

3. Seals as valuable natural resource

Chair: Lars Vesterbirk, Greenland

3.1 Anita Storm (Finland):

Seal products – from skin to oil, various possibilities
- an overview

3.1.1 Discussion

The project involves *ca.* 100 hunters in Ostrobothnia, 100 in the southern Baltic and a further 100 in Sweden. Future activities within the project framework will include the production of a hunter education DVD, development of products using seal meat and oil, and development of seal leather products.

Like many marine products, seal meat contains some contaminants, and there are recommended maximum consumption levels because of this.

3.2 Per Hamnes (Norway):

GC Rieber Skinn AS - 125 years on the global market

GC Rieber Skin AS was founded in 1879 by Gottlieb Christian Rieber and are to day still in the family with 4Th generation as CEO.

More than 20 % of the company is owned by GC Rieber Charity Foundation with contribution to public welfare with focus on social welfare, culture and research.

Vertical integration from "the edge of the ice to the edge of the catwalk" has been the main reason for continuous adjustments over the years.

The sealing industry is environmentally-sustainable, humane and well managed through close cooperation between the local Governments and the industry. Harvesting from renewable recourses, process and product development with fashion designers has given seal skin a niche on the global skin market. Documented effects from seal oil as a health product has further strengthened the sealing industry.

Through the years critical factors have been:

Long term ownership, few decision makers, strong belief in the renewable resource, in business through difficult times, local presence in Canada, Norway and Russia, wide product range and continuous R&D.

3.2.1 Discussion

While the sealing industry is not subsidized in Canada, it is in Greenland and Norway. Subsidies are required in areas producing low volumes and subject to difficult logistical conditions. In general the quality of skins delivered to the buyer is not affected by the presence of a subsidy.

3.3 Lars Walløe (Norway): Seal oil - healthy or not? Report from NAMMCO Workshop

Intake of seal and whale oil is effective in reducing the reactivity of blood cells and reducing the activation of coagulation in a favourable nonthrombotic direction. This property may be the explanation of the low incidence of myocardial infarction in the Greenlandic Inuit population.

In general the participants in the workshop seemed convinced that there are beneficial effects of supplementing an ordinary diet with marine mammal oils, both for the general population and for certain patient groups. However, many of these beneficial effects should be better documented in larger placebo controlled double blind studies conducted and analysed according to strict methodological rules.

Many of the beneficial properties of seal and whale oil must be related to the high content of ω -3 fatty acids in these oils. However, some of the beneficial properties could be related to antioxidants and other substances which are removed or destroyed during the refining operations. One possible solution is to mix the seal oil with an other oil which contains antioxidants, for example olive oil. Further research may identify the substances which are removed during refining, and thus make it possible to add some of them back after refining.

It is still uncertain whether harp seal oil and minke whale oil have properties better than fish oils, e.g. cod liver oil, mainly because the two types of oils have not been used in the same investigations.

There are many reports, both old (back to the factory ship whaling period) and new, which claim beneficial effects on skin diseases (especially eczema and sore skin) of topical applications utilizing raw whale oil.

Seal and whale oil has COX-2 inhibiting properties and thus general pain reducing effects similar to NSAID drugs. The oils have a number of advantages over NSAIDs, since they are not associated with the serious gastrointestinal and cardiac complications of these drugs. Many, but not

all, of the effects above are likely caused by the COX-2 inhibiting properties of seal and whale oils.

For the further studies, there are many challenges. These are for example:

- We do not know if the duodenal application through a nasal-duodenal tube really is necessary for the treatment of inflammatory bowel disease.
- We do not know the minimum effective dosage of oil? Could it be sufficient to administer 15 ml in a spoon twice a day (for joint pain)? The addition of antioxidants (e.g. olive oil) could perhaps allow a higher dosage (3 x 15 ml/day) necessary for treatment of IBD (an ordinary spoon takes 10 ml, a large spoon 15 ml).
- Patient compliance is a problem. Many patients (and healthy persons) do not like the taste and keep belching the oil for many hours, while others take 20ml at a time without problems. Compliance could perhaps be checked by adding a tracer in the oil (e.g. lithium).
- In placebo controlled experiments the taste of the oils has to be disguised. This may be difficult. It is not obvious which oil should be used as placebo in a placebo-controlled experiment. There are problems both with soy oil and olive oil. Some of the participants suggested the use of corn oil (the advantage of corn oil remains to be shown).

It may be rather difficult to find a suitable population for future studies, at least in Norway and for studies related to joint pain, since many different brands of fish oils, seal oils and ω -3 rich preparations already are on the market and are widely used by some patient groups.

It was suggested that it might be productive in future population studies to concentrate on application areas (e.g. cardiovascular disease). A specialist cardiology panel could then address matters such as primary and secondary endpoints of a disease prevention study and how to educate and treat a future population potentially subject to high incidence of heart disease (primary prevention) or a population composed of persons who have had a myocardial infarction (secondary prevention).

3.4 Brian Roberts (Canada): Canada, the European Union and humane wildlife management practices (sealing and trapping)

In 1981, the international market was offering record high prices for seal pelts. In 1983, the European Community passed the "temporary" Seals Directive, banning the import of products from whitecoats (newborn harp seals) and bluebacks (year old and younger hooded seals). Immediately, a

global collapse occurred in prices for all seal products. The only rationale given in the Seals Directive was concern over the "conservation status" of the harp and hooded seal populations; however, it was actually driven much more by the public concern over the morality of sealing, particularly the apparent cruelty in Canadian sealing practices, than whether harp and hooded seals were becoming endangered species.

In 1991, the European Union passed Regulation 3254/91, banning the sale and use of all leghold traps within the EU, and the import of products from 13 wild fur-bearing species, unless the producing country had either banned all leghold traps, or used only traps which met an international humane standard (which did not exist). Like the Seals Directive, conservation was still a stated concern, but Regulation 3254/91 was more open about its true objectives - the morality / humaneness of capturing wildlife, particularly wild fur-bearing animals. Having learned from its failure to defend its management practices and maintain access to the EU market for its seal products, Canada's strategy to address the EU's import ban on wild fur was to acknowledge the legitimacy of the public's demand that wild animals be treated humanely, to embrace it, and then to build on shared moral values with the EU regarding respectful wildlife management.

Subsequently, Canada, the Russian Federation and the USA, initiated negotiations with the EU for the creation of a technical standard to measure the comparative humaneness of trapping systems. The 1997 Canada - EU - Russia "Agreement on International Humane Trapping Standards" (AIHTS) guarantees access to the EU, Russian and Canadian markets for those countries who trap the 19 listed species humanely (*i.e.* in accordance with the standard). Since 1997, humane trapping has virtually disappeared as a public issue within the EU. The value of the EU market for Canadian wild fur is about \$80 million annually. Are there lessons to be learned from Canada's experiences with the EU over these two high profile wildlife harvesting issues?

3.4.1 Discussion

The commercial exploitation of seals does have a "credibility" problem because of past mismanagement of commercial hunts of marine mammals, particularly whales. It is therefore up to the marketers to demonstrate that their product is acceptable, and the author concluded that international standards were an effective way to achieve this.

Canada believes that the recent sealskin trade bans by Belgium and the Netherlands are a violation of the rules of the World Trade Organization (WTO) and will be engaging in formal consultations with these countries at WTO.

3.5 Finn Karlsen (Greenland): National import bans on sealskin – a threat to Greenlandic culture and identity

Hunting seals is a vital component in the everyday life and culture in Greenland – providing a significant amount of income to families living in remote coastal communities. Harp, ringed and hooded seals are the three most important species - hunted in most settlements throughout the year. The income generated from the sale of sealskins is crucial for many families, since the money earned from sealing is invested in new hunting equipment, fishing gear and maintenance.

The catch of harp, ringed and hooded seals in the Northwest Atlantic is based on sustainable management principles, closely monitored by international organisations such as ICES/NAFO and NAMMCO. There exists absolutely no biological or any other evidence to justify the introduction of restrictions on trade in seal products from abundant and healthy populations. Even though sealskins originating from Inuit hunters are exempted from national bans in countries such as Belgium and Holland, Greenlandic hunters will once more suffer from the anti-sealing campaigns as we did in the 1980's. Banning the trade of sealskins in the EU will ruin the platform on which many of these people's livelihoods is based.

In addition to the recent initiatives in Europe, the Inuit are already struggling with ongoing climate changes in the Arctic regions. Weather and ice conditions are changing, and attempts are made at both the local and national levels to adapt to what seems to be severe changes in the Arctic environment. Hunters are forced to change practices and invest in new equipment. For instance, the traditional use of the dog sledge is in many areas no longer possible for several months of the year, since the ice conditions have changed profoundly, and the behaviour of the ice is completely unpredictable compared to a few years ago.

Greenland suffered severely from the 1983 EU-Directive, and it has taken almost two decades to re-establish an economically viable production of sealskins. A ban will once more destroy the global market for sealskin and not just certain parts of the market. The consumer cannot see the difference between sealskins provided by Inuit hunters and skins provided by others. Thus, Greenland cannot accept further restrictions on trade with sealskins – promoted by extreme animal activist groups. In the end, the Inuit culture and identity is threatened and this we cannot accept.

3.5.1 Discussion

It was noted that the main reason given for the present initiative to introduce new restrictions on the trade of seal products was animal welfare in relation to the hunting methods in use. There is no internationally ac-

cepted definition of what constitutes “humane killing” of wild animals. Some believe that the animal should be killed as quickly as possible, while considering other factors such as the safety of hunters, logistics and economic viability. Others believe that animals should be killed without causing “unnecessary” pain, but here the question of how much pain is allowable remains. Without wide agreement on the very definition of humane killing, it seems unlikely that agreement on acceptable hunting methods can be reached, as there will be constant pressure to raise standards beyond what is achievable.

In response to a question a representative of Greenland noted that Greenland cannot join Canada in the trade consultations at WTO, as Greenland is not a full member of WTO and is represented by the EU in that forum. Norway will await developments before making a decision on whether to join the WTO process.

4. Conservation and management of seal stocks

Chair: Tero Härkönen, Sweden

4.1 Arne Bjørge (Norway):

Overall principles for conservation and management of seal species

Conservation is an integrated and important part of all wildlife management. Any management that cannot ensure the conservation of a renewable resource, a population or a species, has failed. The management of seals should not be different from management of other free ranging mammal species. The size and productivity of the population shall determine if this particular population can sustain any harvest. Regional or local traditions, public acceptance of hunting, utilization and usefulness of products, ecological and socio-economic aspects are all important factors to consider before a population can become subject to sustainable harvest.

Overall principles for management of seals should include a definition of the management unit(s), clearly spelled out and prioritized management objectives, a set of defined strategies to achieve the management objectives, a program to monitor whether the management objectives are being met, and a feedback mechanism to improve the management strategies based on new data from the monitoring programme or from other data sources.

The development of management objectives is a process that should involve all stakeholders, the objectives should have wide political and public acceptance and should make sure that the management unit remains or is restored to favourable conservation status. Further, the management objectives should contribute towards maintaining or restoring the entire ecosystem remains at a favourable conservation status.

4.1.1 Discussion

While not directly related to conservation, the issue of full utilization of harvested animals was considered by the author to be important for the public acceptance of harvesting wild animals. It was acknowledged that this was related to the ethics of harvesting rather than conservation, however.

It was also noted that the ethical acceptability of marine mammal harvesting appears to vary greatly between countries, and that this may have implications for the harvesting of trans-boundary stocks.

4.2 Richard Merrick (USA):

Biological reference points – Comparison of ICES and US approach and criteria for IUCN Red List. (Presented by Garry Stenson)

There are three separate but complimentary systems for management of seal populations in the North Atlantic Ocean—US/Canada, ICES and IUCN. Each of these has somewhat different management goals. The US system, mandated legislatively under the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA), is strongly oriented towards population recovery and conservation. Marine mammal species must remain a “significant functioning element in the ecosystem of which they are a part.” Mandates under the Canadian Fisheries Act and Species-At-Risk Act are similar, although commercial harvesting is a viable management option in Canada while it is not in the US. The ICES/NAFO Harp and Hooded Seal Working Group (WGHARP) provides advice to member states on sustainable harvests of these species. Finally, the IUCN system focuses (like the US) on species recovery and provides advice on the assessment of status for populations at risk of extinction.

These systems include biological reference points (and “management” control rules) appropriate to their overarching themes. The US marine mammal management system includes four-tiers of reference points ranging from optimum sustainable populations (OSP) to endangered species (species danger of extinction). Each of these tiers has associated management strategies, although none explicitly allows for commercial harvests.

The WGHARP system was developed for applying a precautionary approach to Atlantic seal harvest management, builds upon Canadian management of Northwest Atlantic Ocean harp seals, and provides multi-tier reference points for North Atlantic harp and hooded seal populations. The system begins with an estimate of a maximal population size (N_{max}) followed by the N_{70} (70%) level, defined as a first precautionary reference point, N_{50} the second precautionary reference point, and a final N_{30} limit reference point. Harvest control rules are associated with each reference point. The WGHARP system also provides definitions for data poor and data rich stocks, and how to manage harvests from data poor stocks.

Ultimately, the efficacy of these reference points and management control rules must be evaluated by how effective they are in achieving the stated management goals (which must be clearly defined at the outset).

4.2.1 Discussion

It was noted that there were some similarities between the WGHARP and Canadian management systems, and the New Management Procedure used by the International Whaling Commission until the 1980's. The latter system was found to be impossible to implement due to disagreements among scientists about population levels and appropriate reference levels. Population estimates tend to be more reliable for seals than for oceanic whales, however, and the estimates for the harp seal populations are well accepted. Reference levels can be adjusted according to management goals, as long as the basic conservation objectives are maintained. In this regard it is always important for management authorities to provide clear management goals.

The management system used by WGHARP has been criticized by the Scientific Committee of NAMMCO (NAMMCO 2006). Firstly, the $N_{\max}$ or pristine population level is defined by the maximum observed population estimate rather than any relation to carrying capacity. Thus $N_{\max}$ changes over time unless the population is stable. Secondly, the reference levels appear to be defined without explicit reference to stated management objectives, and in a sense are management objectives themselves. 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. In response to these criticisms it was again noted that the reference levels can be adjusted in response to management objectives.

Stock delineation is a major problem in wildlife management and this holds true for seals as well. For example recent anecdotal reports suggest that harp seals may be whelping off West Greenland, in areas where whelping has not been observed historically. If this trend is confirmed and continues it may necessitate some change in management strategy.

4.3 Dorothee Convens-Billerbeck (European Commission): EU perspective of seals

In the EU, Community measures are in place related to conservation and trade. All seal species benefit from protection under EU legislation, which includes the "Habitats" Directive. With reference to international trade, the EU has put the EU Wildlife Trade Regulations in place to implement the provisions of the Convention on International Trade in Endangered Species (CITES) in the EU. The Convention's objective is to ensure that trade only takes place if it does not threaten the survival of species of wild fauna and flora.

In the 1970s, various studies had raised doubts about the effects of commercial hunting on the conservation of harp and hooded seals. Moreover, widespread concerns were expressed by the European Parliament

and various stakeholders. As a reaction to these concerns, Council Directive 83/129/EEC [amended by Council Directive 89/370/EEC] prohibits the importation into the Member States of skins of whitecoat pups of harp seals and of pups of hooded seals (blue-backs) and products derived therefrom. This Directive does not apply to products resulting from traditional hunting by the Inuit people.

In response to a renewed interest by political authorities both in the Member states and the European Parliament, the public and major stakeholders, the European Commission undertook on 16 January 2007, in its reply to a Written Declaration by the European Parliament on banning seal products in the European Union, to make a full objective assessment of the animal welfare aspects of the killing and skinning of seals. Part of the assessment is conducted by a specially established Working Group of the European Food Safety Authority (EFSA). The overall assessment covers a critical review of existing and unbiased information, in particular scientific literature and studies on currently used killing methods, broad stakeholder consultations, as well as an assessment of the potential impact of a possible ban of products derived from seal species focussing in particular on socio-economic, trade and legal aspects. This action recognizes the significant level of public concern and is in line with the Commission's commitment to high animal welfare standards. Based on the results of this assessment, the Commission will then take a decision on any further action or measure it would propose at the Community level.

¹⁾ Council Directive 92/43/EEC of 21 May 1992, OJ L 206, 22/07/1992, on the conservation of natural habitats and of wild fauna and flora

²⁾ EU Wildlife Trade Regulations implementing the provision of the Convention on International Trade in Endangered Species (CITES) in the EU: Council Regulation (EC) No. 338/97 of 9 December 1996, OJ L 61, Volume 40, 03/03/1997 and Commission Regulation (EC) No. 865/2006 of 4 May 2006, OJ L 166, 19.06.2006

³⁾ Council Directive 83/129/EEC of 28 March 1983 - OJ No L 091, 09/04/1983, as amended by Council Directive 89/370/EEC of 8 June 1989 – OJ No L 163, 14/06/1989 concerning the importation into the Member States of skins of certain seal pups and products derived therefrom

4.3.1 Discussion

Concerns were raised that, even if Greenlandic and Canadian Inuit are exempted from any trade measures taken by the EU, they will be negatively affected if the market for sealskins is weakened. While it was recognized that Council Directive 83/129/EEC exempted animals hunted in a traditional manner by Inuit, “traditional” was never defined. Most seals killed in Greenland today are shot with a rifle from a motorboat: is that

“traditional”? Many Greenlanders, while reluctantly accepting the protection afforded to their hunting activities through its categorization as “traditional” or “aboriginal subsistence” resent this classification and consider it a type of discrimination.

The EFSA report will be delivered in February 2008, and it is expected that the EC will reach a decision on what action (if any) to take in Spring 2008. Delegates from Greenland considered this schedule to be very rushed and feared that it would lead to a decision being made without proper consideration of all aspects of the situation. Therefore Greenland will request a postponement of any decision on this matter by the EC.

It was clarified that trade of seal products between EU countries (*e.g.* of seal products produced in Finland or Sweden) is presently allowed and would not be affected by any measures taken.

4.4 Per Risberg (Sweden): HELCOM perspective of seal management in the Baltic Sea

The contracting parties of The Baltic Marine Environment Protection Commission (HELCOM; The Helsinki Convention) has agreed on a recommendation on sustainable management of seals in the Baltic. The recommendation concerns reference levels and management units for the three species concerned (grey seal, harbour seal and ringed seal). HELCOM has established a Seal group which has formed three teams working with issues related to population levels, health status and distribution.

4.4.1 Discussion

The management principles adopted by HELCOM propose population reference levels as a fraction of carrying capacity. As present carrying capacity is unknown, the management program will require monitoring to detect whether the population is approaching carrying capacity. The power of detection will depend on data quality and the frequency of sampling (see 1.3).

4.5 Tom Fowler (Canada): Conservation and Management of Northwest Atlantic Harp Seals in Canadian Waters

The Department of Fisheries and Oceans presents the science and the management activity supporting a biologically sustainable, well-managed and humane seal hunt in Canada. An overview of seal species found in Atlantic Canada focuses on the northwest Atlantic harp seal, which constitutes the majority of hunted animals, whose population levels are near the highest ever observed. Catch levels are determined according to the Precautionary Approach, with reference points and predetermined management actions established for various population sizes, supporting the Department's Objective Based Fisheries Management regime for seals.

The current regulatory framework, which has benefited from regular enhancements since the 1960's, and is designed to ensure a well-managed hunt, is described. Fisheries officers monitoring the hunt invest approximately double the coverage of other fisheries in particular sealing areas to ensure sealers comply with Canada's Marine Mammal Regulations. The presentation highlights the economic and social significance of sealing, representing one-third of the overall income to a number of rural communities in Atlantic Canada. Finally, proposed regulatory amendments responding to independent veterinarians' recommendations about killing methods are described which, if carried out properly, will ensure a humane death.

4.5.1 Discussion

Lighter ice conditions have led to a higher frequency of hunters shooting seals in open water in recent years. While this issue is under discussion, there are no plans at present to further restrict this practice.

It was clarified that the Malouf Report (Royal Commission on Seals and Sealing in Canada, 1986), which dealt with the hunting then methods used in the commercial hunt, referred to the hunting of whitecoat pups, which has since been banned.

It was clarified that the Vessel Monitoring System (VMS), which enables Fishery Officers to track sealing vessels in real time, is presently required on larger vessels only. It is expected that VMS will be required on smaller vessels in the future, although some of the hunting is done from small boats and skiffs, for which VMS is not feasible.

4.6 Tero Sipilä and Jan Ekebom (Finland): Toolboxes for conservation and management of marine areas

Metsähallitus manages state-owned lands and water areas and also provides functions such as monitoring and protection of some endangered species, e.g. Saimaa Seal, and organizes hunting and fishing in state-owned areas etc. As regards the Baltic Sea, we have seven seal protection areas and four national parks. There are also approx. 140 EU Natura 2000 Programme Areas. National parks have management plans and it is possible to produce management plans for the seal protection areas, N2000 areas, and also for non-protected state-owned waters and islands. We have some quite good databases, e.g. on birds, seals and habitats on islands and islets, but very little information about submarine habitats and species. The demands, hopes and traditions of local stakeholders, or citizens, and the needs of public recreation activities are taken into consideration when making management plans.

The practical tools in protection are information, guidance of users, and supervision, inspection of legality of hiking, hunting, fishing, etc. Traditional tools are visitor centres, leaflets, and licenses. In 1996, we had 1.6 million hits on our websites (www.outdoors.fi), and this demonstrates what a powerful tool for management websites can be. In providing descriptions of areas and services; visitor centres, camping places, routes, etc.

In recent years, the cormorant and some alien species, for example, have rapidly spread out over the Baltic Sea. Also the standards for service visitors change with time. In future, we will probably need more flexible management of the areas. At present, the use of marine areas, resources and services in the Baltic Sea is intense and is becoming very complicated. Conflicts are bound to arise more frequently between the different users of the marine areas. Marine management and governance will become much more demanding. Seal management should be an integrated part of marine-spatial plans that should also acknowledge other activities and uses of the marine areas. None of the different marine uses, e.g. dredging, seal hunting, nature conservation or leisure boating, can be planned and managed as isolated exercises.

4.7 Håkan Westerberg (Sweden): Tools to solve conflicts between conservation of large vertebrates and the use of biological resources

Conflicts arising from the competition of humans and wildlife for biological resources are as old as mankind. Where conservation management becomes a success this often reignites old conflicts. To reconcile such conflicts we need ecologically effective, economically efficient, and socially acceptable means to manage the conflicts. This is most successful if management and policy have adequate tools in place well before a conflict becomes virulent.

An interdisciplinary team of scientists from nine European countries have studied this question in the EU-project FRAP – Framework for Biodiversity Reconciliation Action Plans. The aim was to use fisheries and fish-eating vertebrates (seals, otter, and cormorants) as model cases to assess and illustrate successful approaches for conflict reconciliation. The situation differs strongly across Europe and among species, ranging from no conflict to escalation at the local, regional, or European level.

The grey seal conflicts in the Finnish part of the Kvarken area and in the Swedish archipelago in the Baltic proper were among the model cases. How the conflict is mitigated reflects the ecological peculiarities of the conflict and the socio-economic peculiarity of small-scale coastal fishery as the main economic sector affected.

The rudiment of a generic reconciliation framework which has emerged in the FRAP project involves several components that all are important for success:

- Identification of the key ecological and socio-economic factors;
- Diet studies are essential;
- A systematic description of the facts, values, and interests that the different stakeholder groups bring to the process in order to reach a common conflict perception;
- Classic ecological wildlife management using lethal and fertility control *etc.* only works under restricted conditions. Any manipulation can have adverse effects on the species and monitoring must be implemented as an integral part;
- Participatory approaches should be included.

Is there a characteristic process model to be derived from the history of the relative advanced conflict management in the Finnish and Swedish seal conflicts? An element of joint learning is the building of trust between the stakeholders with different interests. A rather controversial debate and dissent about the conflict and its solution in the first years of the conflict has been followed by more trust, consensus, and partial or temporary solutions that emerged as soon as not just single measures

have been opted for, but more balanced solutions through combinations of different kinds of measures.

4.8 Egil Ole Øen (Norway):

An overview of hunting methods in the North Atlantic

The hunting methods vary considerably over the world. In general, seals are hunted both on ice, on dry land (islets, beach etc) and in the water. The method used depends largely on species, hunting traditions and regulations, time of the year and environmental conditions. Some seal species may be difficult to approach closely before they are rendered unconscious or dead and thus the stunning and killing devices must usually be designed to be applied to the animal from distance.

Most weapons used for the hunting and killing of wild animals are designed to stun, bleed and kill the animal in one and the same operation by inflicting enough damage to vital organs to render the animal unconscious or/and dead instantly or very fast. The killing device has usually to be applied from distance and for marine mammals it is usually combined with some gears retrieve the animals. The methods used to stun and kill domestic animals in slaughterhouses are designed to be applied directly to the desired organ with the animal in a fixed position, but when the killing methods of marine mammals are often referred to and the methods compared with the slaughterhouse practice.

The following aspects should be taken into account when making the choice of weapons used for seals: Target species, environmental conditions, hunting traditions, availability of weapons and economy.

The following weapons and gears are used for seal hunting either alone or in combination: Rifles and shotguns, hakapik, clubs, hand held harpoons and nets and traps.

Rifles are major weapons for hunting seals and there are regulations, which for example define the minimum calibre (usually .222 or .308 depending on age and size of animal) with expanding bullets (Canada, Finland, Iceland, Norway and Sweden) and low power ammo (cal. .22 as minimum with 3g bullets) in UK. In Iceland the calibre is .22 from short range for pups of grey seals and for adult grey seals the rifle calibre is usually .222 and .243. In Greenland the hunting methods varies regionally and seasonally but in general on winter and sea ice ringed and bearded seals are hunted by breathing holes with a calibre .30-06 rifle and then a lance is used to ensure swift kill. Nets are used closer to the shore and in summer and open water hunt small boats/dinghies as well as larger vessels up to 30 feet using rifles calibre .22 Mag to .30.06 are used.

When hakapik is used for hunting, then the first blow with the blunt part shall will damage the skull bones over the brain, the brain cortex and probably also deeper parts of the brain and renders the animal uncon-

scious and insensitive to pain. After this the second blow with the sharp spike shall destroy the brain-base to ensure that the seal is dead or does not regain consciousness before bleeding. When using hakapik, there are advantages and disadvantages. The main advantage is that the hunter is close to the animal, and if necessary, the blow can be rapidly repeated and the risk of struck and lost is very low. The main disadvantage is the risk for "bad" hits, which may be very painful for the animal.

When using a club for hunting, the advantage is in general similar to the hakapik, but the blow with the spike that penetrates into the deeper parts of the brain is lacking.

In netting and trapping, seal nets are set at leads in the ice, breathing holes or under ice flows. These hunting methods are known to be used by aboriginal hunters in Canada, Greenland, Russia and US (Alaska). Methods are also used in Iceland. Trap nets are especially used in Russia and are set in the sea and in the rivers. The death of the seal occurs usually by "dry" drowning or the seal is killed by other means.

The so called Iceland-net is commonly used for seal pup in spring in littering places. Nets are set close to the small rocky islands or across creeks and channels. These bottom nets are made heavy to prevent the seal from surfacing for air. Nets in rivers are set upstream between riverbanks to catch the pup, which are then killed by a club or rifle cal. 22.

4.8.1 Discussion

The author elaborated on the activities of the NAMMCO Working Group on Hunting Methods, of which he is the chairman. The Working Group brings together hunters, scientists and managers in a collaborative forum focussed on improving hunting methods in terms of animal welfare, efficiency, effectiveness and hunter safety. The Working Group has held several workshops over the past decade, covering such topics as ballistics, methods for hunting seals and walrus, and struck and lost in sealing and whaling. Active hunters have been an integral part of the process and have provided most of the recommendations arising from the workshops. The reports from these workshops are published in the NAMMCO Annual Reports series.

5. Sealing the future

Panel discussion

Chair: Kate Sanderson, NAMMCO

Panellists:

Tom Fowler, Canada

Amalie Jessen, Greenland

Dorotee Convens-Billerbeck, European Commission

Madeleine Nyman, Finland

Per Hamnes, Norway

Halvard Johansen, Norway

Bernie McConnell, UK

Sven-Gunnar Lunneryd, Sweden

Garry Stenson, Canada

Jari Luukkonen, Finland

Kate Sanderson introduced herself and the panellists. She noted that while the Faroe Islands were no longer a sealing nation, they did have a history of seal hunting and were dependent on fishery resources. As a result the Faroes were very concerned with marine sustainable use issues. The Government of the Faroe Islands was instrumental in the founding of the North Atlantic Marine Mammal Commission (NAMMCO) in 1992. NAMMCO is a regional scientific and management organization which focuses on modern approaches to the study of the marine ecosystem as a whole, and to understanding better the role of marine mammals in this system. NAMMCO member countries are Greenland, Iceland, the Faroe Islands and Norway, while Canada, the Russian Federation, Japan and Denmark are observers. NAMMCO has a permanent secretariat based in Tromsø, Norway, and Kate Sanderson is presently the Chair of the Council of NAMMCO

NAMMCO is structured with a Council that provides overall policy and decision making, 2 Management Committees (one for seals and walrus and another for cetaceans) which provide management advice to member countries, and a Scientific Committee which provides scientific advice on stock status, sustainable catch levels and other matters at the request of the Council. NAMMCO operates an International Observation Scheme to provide independent observation of the hunting activities of member countries. In addition NAMMCO hosts a Working Group on Hunting Methods, which has held several international workshops de-

voted to improving hunting methods for cetaceans and pinnipeds, and publishes the NAMMCO Scientific Publication series.

NAMMCO is pleased to be involved in the organization of this conference. NAMMCO hosted a similar conference 10 years ago, also called "Sealing the Future". Sanderson noted that it was very encouraging to see these discussions continue, with the involvement of the Baltic countries. Many things have changed over the decade, but many of the same issues remain or have resurfaced.

The panel discussion was organized with several themes and questions to stimulate discussion and debate among the panellists and audience. Here the discussion is reported thematically without identification of the speakers.

5.1 Scientific basis for managing sealing and seal/fisheries interactions

5.1.1 Is harvesting a surplus the only definition of a sustainable harvest?

It was agreed that this was mainly dependent on the time scale of the management horizon. In the long term it is self evident that harvesting at a rate greater than the rate of increase of a population will result in population reduction and eventual extermination if it is continued indefinitely. However there may be cases where a population reduction is a management goal, in which case harvesting over the short term at what are by any definition unsustainable rates is required to achieve the reduction. Another case is illustrated by the Canadian and ICES/NAFO regimes for harp seal management, wherein rates of harvest greater than the rate of increase could be allowed when the population is above the N_{70} level (see 4.2 and 4.5). It was cautioned that allowing high rates of harvest temporarily can affect prices and/or create unrealistic expectations among harvesters.

5.1.2 How certain do we need to be to manage seals in relation to their role in the ecosystem, in particular in relation to interactions with fisheries?

Scientists and managers gave on the panel quite distinct responses to this question. While scientists emphasized the magnitude of uncertainty, the difficulty and expense of reducing uncertainty and problems with conveying uncertainty in their results to managers, the managers countered that they were cognizant of uncertainty but had to make decisions using what information was available.

Scientists on the panel noted that the results of ecological studies are often ambiguous and have a wide range of possible answers. However

they found it difficult to convey this uncertainty to managers and the public in an understandable way. It was their perception that managers tended to focus on the mean without regard to the variance. Managers countered that they did understand the level of uncertainty in scientific results, but often could not delay action to await more precise results. This was a widely understood component of the precautionary principle.

There was some discussion about the level of uncertainty that is acceptable in different cases. When making a decision, it is important to consider the consequences of being wrong, and what level of risk is acceptable in that context. Traditionally scientists have expressed uncertainty through the use of confidence intervals, almost invariably at the 95% confidence level. However there is no objective reason for choosing this level. For some management decisions when, for example, the consequences of being wrong do not pose a conservation risk to the population in question, a greater level of uncertainty may be acceptable. This can be modelled explicitly in a management procedure, but that was beyond the scope of this discussion.

The level of certainty that a scientific study, such as a survey, can achieve, tends to be directly related to the intensity of sampling and therefore the level of funding available. The quality of scientific advice is therefore related to the resources available to scientists. However it was also pointed out that fisheries scientists have not traditionally worked in a full ecosystem context, and it may take some time and development of new methodologies and analytical techniques before ecosystem modelling can deliver meaningful predictions. The need for “big science” projects involving integration across disciplines was also noted.

Some managers indicated that scientific advice was not the only thing that influenced their decisions. Managers have to consider all potential interactions including those with hunters and fishers. Jessen noted that the knowledge held by hunters and fishers – “user knowledge” – can be used to reduce the uncertainty inherent in scientific advice, and that this approach was being implemented in Greenland and Canada.

5.2 Conservation and management issues and approaches

5.2.1 How to the population reference levels used in the ICES/NAFO and Canadian harp seal management procedures differ from management goals?

Stenson noted that the systems provided a framework within which management can set their own goals which may be related to socioeconomic and other factors. The lower limits (*e.g.* N_{lim} , see 4.2 and 4.5) are scientifically based and are related to the minimum viable population size and the power of survey methods to detect whether the

population is approaching a dangerously low level. Between $N_{\max}$ and N_{70} , managers are free to a stock size and/or rate of growth based on market conditions, socioeconomic or other factors. However the system requires a full commitment from managers to stick to the plan in good times and bad. Stenson also clarified that uncertainty in population size is fully accounted for in population assessments, and in determining whether a particular reference level has been reached.

Other panellists noted that wildlife management is primarily concerned with managing human activities, and a great deal of information in addition to that on the status of the population in question is required for effective management. The manager must take into account harvesting economics and politics as well. It was also noted that while the risk to the wildlife population was explicitly accounted for in the above described procedure, there was no consideration of the risk to other populations (*e.g.* fish). In this regard it was noted that while the precautionary principle functions well for single species approaches, it is much less useful in a multispecies context when, at times, decisions must be made that will benefit some species but be detrimental to others.

5.3 International trade and public perceptions

5.3.1 To what extent should trade measures be used as a management tool for seals?

Hamnes noted that there was a great deal of uncertainty in the commercial sealing business. Sealskins are purchased only once per year, and the prices reflect market expectations for the coming year. In most cases it is not realistic to further develop domestic markets for seal products, so international trade is essential for the viability of commercial sealing.

Jessen felt that the situation in Greenland was widely misunderstood. Greenlanders have to make use of the resources they have available, and that includes seals. The EU has provided exemptions for seal products from Greenland in the past, based on their status as traditional hunters. The same situation exists for whaling under the auspices of the International Whaling Commission, where Greenlanders are allowed to harvest as “aboriginal subsistence” whalers. Greenlanders resent being categorized as “museum pieces”; they are a modern people making a living in a tough environment. Nevertheless they have been forced to accept this categorization, as they have no choice but to continue to harvest the resources they have available.

Johansen agreed that a trade ban on seal products would have worse consequences for Greenlanders and other Arctic peoples than for Norwegians. Commercial sealing is an insignificant part of the

Norwegian economy and is indeed heavily subsidized. However it is a part of the Norwegian culture and identity. In addition Norway did not wish to lose the “traditional knowledge” associated with sealing, and with it the ability to effectively manage seal populations should that become desirable. Johanssen felt that the conservation of cultures should be considered when making decisions affecting international trade.

Sheryl Fink (IFAW) reminded the conference that seals were wild animals that in many cases had been heavily depleted historically. Some populations have now recovered or are recovering, but this is mainly because commercial hunting has been stopped due to conservation concerns and international trade restrictions. Therefore international trade restrictions have been a very effective conservation tool, and removing them would once again subject seal populations to unsustainable commercial hunting. She also noted that trade restrictions could be effective in forcing the industry to adopt and use more humane hunting methods.

Stenson and Johansen countered that the prediction that commercial hunting would result in serious population depletion assumed that we have learned nothing from history. Seal populations are closely monitored and management systems are in place that would prevent this from happening. They felt that the risk to seal populations must be considered in the context of the current management systems, not what was used decades ago.

5.4 Concluding remarks

Kate Sanderson concluded by noting that there had been insufficient time to cover all the themes planned for the panel discussion. While it was obvious that significant points of contention remained, particularly in the areas of animal welfare and the use of trade restrictions, she was confident that there was a general consensus that seals were a legitimate natural resource that could be harvested, used and traded.

Sammanfattning

Säljakt har länge varit en viktig del av många lokalsamhällens ekonomi och kultur i Östersjön och Nordatlanten. De flesta sälbestånd som nyligen undersökts är rika på djur och djuren är friska, vilket ger en bra grund för en fortsatt hållbar användning.

Den internationella konferensen om ”Sälar och samhälle – Hur man kan förvalta resurser och interaktioner i Östersjön och Nordatlanten” tog upp många viktiga frågor vad gäller ekosystemets påverkan på sälbestånden, hur bestånden kan bevaras samt konflikterna med fiskeindustrin och den hållbara användningen av sälbestånden. På konferensen talade man även om sälar som en värdefull naturresurs och diskuterade hur man kan bevara och förvalta sälbestånden i Östersjön och Nordatlanten i framtiden.

Efter decennier med stadig exponentiell tillväxt hos bestånden i Östersjön och Nordatlanten visar numera många bestånd av havsdäggdjur upp en sakta avtagande tillväxttakt. Några bestånd har till och med minskat under de senaste åren. Även när man ser tillbaka, så finns det inte alltid en förklaring till varför beståndens tillväxttakt förändras.

Sälarna påverkar det kommersiella fisket och de kommersiella fiskbestånden. Att minska interaktionen mellan sälarna och fiskeindustrin respektive människan vid områden med vattenbruk är en global fråga. Frågor om hur sälarna påverkar vattenbruket och återhämtningen av utarmade fiskbestånd är dock kontroversiella och står i fokus för betydande forskningsprojekt. De generella principerna för sälkötseln bör bestå av definierade förvaltningsenhet(er), tydligt utskrivna och prioriterade förvaltningsmål, ett antal definierade strategier för att uppnå dessa mål, ett program för att övervaka att målen uppfylls och en uppföljningsmekanism för att förbättra förvaltningsstrategierna utifrån nya uppgifter från övervakningsprogram eller andra datakällor.

Att man påbörjade arbetet med att bevara sälen i Östersjön kan i stort sett ses som en reaktion på den drastiska minskningen i sälbestånden som kulminerade på 1960- och 1970-talen. En av grundlagarna inom den bevarande biologin är att små bestånd är mer sårbara för förändringar än stora bestånd och för ett litet bestånd som vikaresälarna uppträder nu ett nytt hot – den globala klimatförändringen. För arktiska arter, som är beroende av is, kan klimatförändringen visa sig vara ännu mer katastrofal – en förändring som även drabbar de stora bestånden.

Jakten av havsdäggdjur och jaktmetoderna orsakar alltid heta debatter. Sättet och metoderna att jaga på varierar mycket på olika håll i världen. I allmänhet jagas sälar både på is och torra land (skär, stränder m.m.) samt i havet. Vilka jaktmetoder som används beror mestadels på vilka arter

som jagas, på jakttraditioner och bestämmelser, årstider och miljöförhållanden. De flesta vapen som används för att jaga och döda vilda djur är utformade för att samtidigt bedöva, sårta och döda djuret genom att skada djurets vitala organ så mycket att det blir medvetslöst eller/och att döda det omedelbart eller mycket snabbt. Den dödande utrustningen måste vanligtvis användas på långt håll och utrustningen som används på havsdäggdjur är ofta utrustad med några mekanismer som kan hämta in djuret efteråt.

Säljakt utförs numera endast i ett fåtal länder. Säljakt är ett kontroversiellt ämne till och med i några av de länder som har en sälindustri. Om det finns en allmän opinion om säljakt i länder där sådan jakt inte förekommer, så är den oftast negativt inställd mot säljakt. Om den allmänna opinionen i ett land ogillar säljakt, tenderar även de flesta politiker att ha denna uppfattning och att vara mot säljakt i allmänhet eller i alla fall mot kommersiell säljakt.

Säljakten är en väsentlig del av det dagliga livet och kulturen på Grönland till exempel och är en viktig inkomstkälla för familjer som lever i avlägset belägna kustsamhällen. Sälskinnen har ett stort ekonomiskt värde, men också köttet brukar säljas på lokala marknader. I dessa områden använder man sig av slädhundar och sälkött och valspäck utgör en stor del av slädhundarnas föda. Grönlandssäl, vikaresäl och blåssäl är de tre viktigaste arterna som jagas året om i de flesta samhällen på Grönland. Intäkterna från sälskinnshandeln är mycket viktiga för många familjer, eftersom pengarna som tjänats in på säljakt investeras i ny jakt- och fiskeutrustning och i redskapsreparationer. Grönlands lokalsamhällen drabbades hårt av EU-direktivet från år 1983 och det har nästan tagit tjugo år att återställa en ekonomiskt hållbar sälskinnsproduktion.

Produkter med olja från havsdäggdjur är även bra för hälsan. Det har visat sig att intag av säl- och valolja effektivt kan minska reaktiviteten av blodproppar och reducera koagulering på ett positivt sätt som förhindrar blodproppar. Denna egenskap kan vara förklaringen till varför antalet hjärtinfarkter bland inuitbefolkningen på Grönland är så lågt.

Appendix 1: Conference program

<u>Monday 15 October 2007</u>		Time
Get-together, Spa Hotel Rantasipi Tropiclandia		19.00-21.00
<u>Tuesday 16 October 2007 10.00-18.00</u>		Time
Registration		08.30-10.00
Opening and welcome: Senior Scientist Eero Aro (Finland, Organizing Committee)		10.00-10.15
Opening address: General Director Eero Helle (Finland)		10.15-10.30
<u>THEME SESSION 1</u>		
STATUS AND ECOSYSTEM EFFECTS OF SEAL STOCKS IN THE BALTIC SEA AND THE NORTH ATLANTIC		
Chair: Eero Aro, Finland Rapporteur: Daniel Pike, Canada		
<u>Tuesday 16 October 2007 10.30-15.00</u>		Time
Eero Helle (Finland): Grey seal and ringed seal abundance and distribution changes in the Baltic Sea. Where are we now and where are we going?		10.30-11.00
Mike Hamill (Canada): Population dynamics of harp, hood and grey seals in the North Atlantic, uncertainties in estimations and predictions		11.00-11.30
Tero Härkönen (Sweden): Seals in the Baltic ecosystem. Carrying capacity and predator-prey relationships. What is the level of knowledge?		11.30-12.00
Garry Stenson (Canada): Predator-prey impacts of seals on commercial fisheries. The complexities, uncertainties and inconsistencies in the current debate.		12.00-12.30
Lunch		12.30-13.30
Brendan P. Kelly (USA): Ice seal population structure and environmental change. Consequences of climate change. Where we are now and what we might expect.		13.30-14.00
Tore Haug (Norway): Seals in the Barents Sea, Svalbard and the Greenland Sea. The effects of an abundant predator in a relatively simple ecosystem. Big changes from small causes.		14.00-14.30
Kjell Tormod Nilssen (Norway): Status of harbour seal stocks in the Baltic and the North Atlantic.		14.30-14.50
Summing up: Chair and Rapporteur		14.50-15.00
Coffee Break		15.00-15.30

International Conference on “Seals and society – how to manage resources and interactions in the Baltic Sea and North Atlantic”

SPA HOTEL RANTASIPI TROPICLANDIA

VAASA, FINLAND

16-18 OCTOBER 2007

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THEME SESSION 1 (Tuesday 16 October 2007) 10.30-15.00) STATUS AND ECOSYSTEM EFFECTS OF SEAL STOCKS IN THE BALTIC SEA AND THE NORTH ATLANTIC	
Chair: Eero Aro, Finland Rapporteur: Daniel Pike, Canada	
Eero Helle (Finland): Grey seal and ringed seal abundance and distribution changes in the Baltic Sea. Where are we now and where are we going?	10.30-11.00
Mike Hamill (Canada) and Garry Stenson (Canada): Population dynamics of harp, hood and grey seals in the North Atlantic, uncertainties in estimations and predictions	11.00-11.30
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Lunch **12.30-13.30**

Brendan P. Kelly (USA): Ice seal population structure and environmental change.
Consequences of climate change. Where we are now and what we might expect. 13.30-14.00

Tore Haug (Norway): Seals in the Barents Sea, Svalbard and the Greenland Sea. The effects of an abundant predator in a relatively simple ecosystem.
Big changes from small causes. 14.00-14.30

Kjell Tormod Nilssen (Norway): Status of harbour seal stocks in the Baltic and the North Atlantic. 14.30-14.50

Summing up: Chair and Rapporteur 14.50-15.00

Coffee Break 15.00-15.30

THEME SESSION 2 (Tuesday 16 October 2007) 15.30-18.00)**SEALS AND SOCIETY- CONSERVATION, FISHERIES AND SUSTAINABLE USE**

Chair: Arne Bjørge, Norway
Rapporteur: Daniel Pike, Canada

Time

Antti Halkka (Finland): Historical background for conservation and preservation and critical points in the Baltic 15.30-16.00

Sven-Gunnar Lunneryd (Sweden): Seals in the Baltic in relation to fisheries 16.00-16.30

Garry Stenson (Canada): Seals, fisheries and aquaculture in the North Atlantic 16.30-16.50

Amalie Jessen (Greenland): Sustainable sealing in Greenland 16.50-17.20

Halvard P. Johansen (Norway): Sealing in Norway, critical points and interactions. 17.20-17.50

Summing up day one	17.50-18.00
End of Day One	18.00
Reception at the Vaasa City Hall	19.00-20.30

THEME SESSION 3 (Wednesday 17 October 2007) 09.00-12.30)

SEALS AS VALUABLE NATURAL RESOURCE

Chair: Lars Vesterbirk, Greenland

Rapporteur: Daniel Pike, Canada

	Time
Introduction (Chair)	09.00-09.05
Anita Storm (Finland): Seal products – from skin to oil, various possibilities - an overview	09.05-09.30
Per Hamnes (Norway): GC Rieber Skinn AS - 125 years on the global market	09.30-10.00
Lars Walløe (Norway): Seal oil - healthy or not? Report from NAMMCO Workshop	10.00-10.30
Coffee break	10.30-11.00
Brian Roberts (Canada): Canada, the European Union and humane wildlife management practices (sealing and trapping)	11.00-11.30
Finn Karlsen (Greenland): National import bans on sealskin – a threat to Greenlandic culture and identity	11.30-12.00
Discussion	12.00-12.30

Lunch 12.30-13.30
THEME SESSION 4 (Wednesday 17 October 2007) 13.30-18.00)

CONSERVATION AND MANAGEMENT OF SEAL STOCKS

Chair: Tero Härkönen, Sweden

Rapporteur: Daniel Pike, Canada

Arne Bjørge (Norway): Overall principles for

conservation and management of seal species	13.30-14.00
Richard Merrick (USA): Biological reference points – Comparison of ICES and US approach and criteria for IUCN Red List (presented by Garry Stenson)	14.00-14.30
Dorothee Convens-Billerbeck (European Commission): EU perspective of seals	14.30-15.00
Coffee break	15.00-15.30
Per Risberg (Sweden): HELCOM perspective of seal management in the Baltic Sea	15.30-16.00
Tom Fowler (Canada): Conservation and management of seal stocks in Canada	16.00-16.20
Tero Sipilä and Jan Ekebon (Finland): Toolboxes for conservation and management of marine areas	16.20-16.40
Håkan Westerberg (Sweden): Tools to solve conflicts between conservation of large vertebrates and the use of biological resources	16.40-17.00
Egil Ole Øen (Norway): An overview of hunting methods in the North Atlantic	17.00-17.30
Summing up day two	17.30-18.00
End of Day Two	18.00
Conference dinner	19.30-23.00

THEME SESSION 5 Thursday 18 October 2007 09.00-12.00

SEALING THE FUTURE

Panel discussion

Chair: Kate Sanderson, NAMMCO

Rapporteur: Daniel Pike, Canada

Part I: Harmonizing the future - general management principles	09.00-10.00
Part II: Stakeholders cooperation in seal conservation and management in the future	10.00-10.30
Coffee break	10.30-11.00
Panel discussion continues	
Part III: Stakeholders cooperation in seal conservation and management in the future & Sustainable development and sustainable use of resource	11.00-12.00
Panellists:	
Tom Fowler, Canada	
Amalie Jessen, Greenland	
Dorotee Convens-Billerbeck, European Commission	
Madeleine Nyman, Finland	
Per Hamnes, Norway	
Halvard Johansen, Norway	
Bernie McConnell, UK	
Sven-Gunnar Lunneryd, Sweden	
Garry Stenson, Canada	
Jari Luukkonen, Finland	
Closing session: Summing up	12.00-12.30
End of conference	12.30
Lunch	12.30-13.30
Press conference: Conclusions of the Conference	13.30-15.00