TOWARDS FAVOURABLE CONSERVATION STATUS OF BALTIC SEA BIODIVERSITY

HELCOM Overview 2007

HELCOM Ministerial Meeting

Krakow, Poland, 15 November 2007

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Note: This is a background document for the HELCOM Ministerial Meeting 2007 elaborated by the HELCOM Secretariat.

TOWARDS A FAVOURABLE CONSERVATION STATUS OF BALTIC SEA BIODIVERSITY

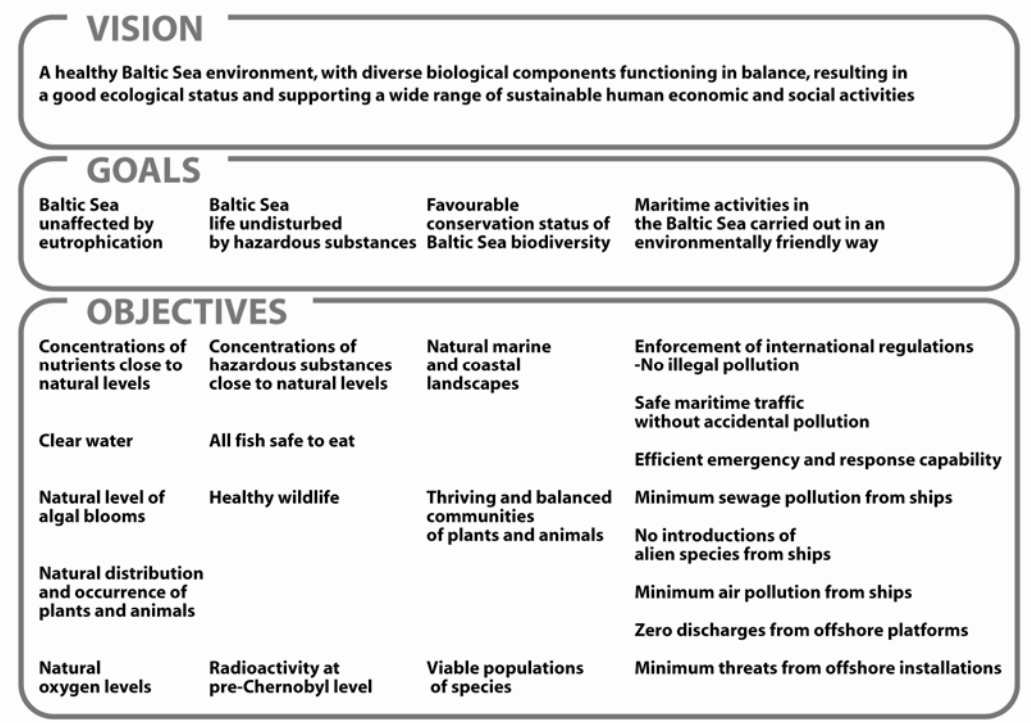
Preface

The aim of this concise overview is not to provide a comprehensive assessment on the status of biodiversity and nature protection in the Baltic Sea but to serve as background information for the 2007 Krakow HELCOM Ministerial Meeting. The overview outlines an indicator-based biodiversity assessment in order to

- *to show how ecological objectives could be used as basic assessment tools when assessing the favourable status of marine landscapes, communities and species, and*
- *to highlight targets and indicators in the HELCOM Baltic Sea Action Plan.*

A comprehensive, integrated HELCOM assessment of Baltic marine biodiversity and nature conservation will be made by 2009.

For the implementation of the ecosystem approach, HELCOM has adopted a system of vision, strategic goals and ecological objectives. Even if the Baltic Sea Action Plan is developed as under four separate thematic areas, including nature conservation, the aim to protect biodiversity is central to all themes and to the system as a whole.



The specific **strategic goal** for the protection of biodiversity is to reach a "favourable conservation status of Baltic Sea biodiversity". This means that biodiversity is restored and maintained and all elements of the marine food-webs, to the extent that they are known, occur at normal abundance and diversity. The **ecological objectives** related to this goal are divided into marine and coastal landscape level, community level and species level, reflecting the Convention on Biological Diversity (CBD), in which the assessment is focused on variability "within species", "between species" and "of ecosystems".

In order to make the ecological objectives operational, concrete short-, middle- and long-term **targets** should be set and the progress toward these followed with **indicators**.

This report is based on existing information collected by HELCOM and other organisations as well as on scientific literature. The results concerning the Baltic Sea Protected Areas (BSPA) network are based on the information submitted by the Contracting Parties to the HELCOM BSPA Database (http://bspa.helcom.fi).

EXECUTIVE SUMMARY

The following tables give a general overview how the favourable status of the Baltic Sea biodiversity and nature conservation has been assessed in this document.

The status is categorised using flounder smileys.

 indicates a favourable status or a positive trend,

 an unfavourable status or a negative trend while

 is neutral or no trend.

 refers to big gaps in information

NATURAL MARINE AND COASTAL LANDSCAPES		
TARGET	**INDICATOR**	**STATUS**
By 2010, to have an ecologically coherent and well-managed network of coastal and offshore BSPAs, Natura 2000 areas and Emerald sites in the Baltic Sea By 2012 to have common broad-scale spatial planning principles for protecting marine environment and reconciling various interests concerning sustainable use of coastal and offshore areas, including the Coastal Strip as defined in HELCOM Rec. 15/1. By 2021 to ensure that "natural" and near natural marine landscapes are adequately protected, and the degraded areas will be restored	Designated BSPAs, Natura 2000 and Emerald site areas as a percentage of total sub-region areas	
	Percentage of important migration and wintering areas for birds within the Baltic Sea area which are covered by the BSPAs, Natura 2000 and Emerald sites	
	Number of BSPAs protecting threatened and/or declining species (for each species separately)	
	Percentage of endangered and threatened habitats/biotopes' surface covered by the BSPAs in comparison to their distribution in the Baltic Sea	
	Percentage of marine and coastal landscapes in good ecological and favourable conservation status	

What has been achieved so far?

The network of Baltic Sea Protected Areas (BSPAs) includes 86 officially notified and designated sites, established according to HELCOM Recommendation 15/5. About one fifth of the BSPAs have a management plan and one third of the sites have a management plan under preparation. HELCOM has also identified important new sites as potential candidates for future BSPAs. In addition to the BSPAs a number of other protected areas have been established in the Baltic Sea including Natura 2000 sites required by the EU Habitats and Birds Directives and Emerald sites launched by the Council of Europe. Further, many of the Important Bird Areas outside these networks are protected by national legislation. Note that Contracting Parties can designate their Natura 2000 and Emerald sites as BSPAs without any additional measures.

The 2003 joint HELCOM/OSPAR Ministerial Meeting reaffirmed commitments to establish a network of well managed marine protected areas (MPAs) by 2010. HELCOM and OSPAR have adopted in 2003 a joint Work Programme to ensure that this work is done consistently across their

maritime areas. HELCOM has adopted main criteria for evaluation of the ecological coherence of the BSPA network, a complete assessment will be conducted by 2009.

In order to assess the ecological coherence of the network of marine protected areas – BSPAs, Natura 2000, and Emerald sites - relevant information of all of them should be combined for further analysis and to identify need of further designations. Among other things, more information on the quality and distribution of marine landscapes and habitats is needed. The landscape and habitat maps produced by the INTERREG-IIIB Balance Project will be a valuable input for further analysis of the ecological coherence of the network of marine protected areas (c.f. www.balance-eu.org).

Where are the gaps?

Broad scale marine planning has been used around the world, and could be developed in the Baltic Sea, to protect biological diversity of the marine environment and sensitive marine resources from overuse as well as to separate conflicting uses. The seeds of such a planning system can be seen in the existing spatial controls such as routing measures for maritime traffic, various protected areas and fisheries closures. The new HELCOM Recommendation on development of broad-scale marine spatial planning principles in the Baltic Sea area is a step towards such a planning system.

Let's join forces to reach the targets

Establishment of protected areas alone is not sufficient to attain "natural coastal and marine landscapes" – especially actions to reach the HELCOM objectives under the goal "Baltic Sea unaffected by eutrophication" are of major importance.

HELCOM should develop, test and evaluate, in co-operation with other relevant international bodies, broad-scale, cross-sectoral spatial planning ensuring the protection of the marine environment and nature but allowing sustainable use of its resources.

To improve the protection efficacy of the BSPA network, an assessment of the ecological coherence of the BSPA network together with the marine Natura 2000 and Emerald sites should be carried out.

At national level, the first action to facilitate the analysis of ecological coherence of the network of marine protected areas should be the designation of already established marine Natura 2000 and Emerald sites as BSPAs.

Furthermore, to increase the ecological coherence, designation of additional BSPAs with special attention to inclusion of new marine BSPAs beyond territorial waters (within EEZ) should be done in order to reach the 2012 targets of the UN WSSD Johannesburg Declaration and the Convention on Biological Diversity.

To fulfil the requirements of good governance (cf. HELCOM Recommendation 15/5) the Contracting Parties should finalize management plans, or measures, and routines for their BSPAs, according to the HELCOM BSPA Planning and management: Guidelines and tools.

In order to fulfil conservation targets, the competent authorities, in co-operation of the Baltic Regional Advisory Council (RAC) and HELCOM, should develop and implement management measures for fisheries inside marine protected areas in the Baltic Sea area.

In order to evaluate the effectiveness of the network of marine protected areas in covering marine underwater landscapes, such marine landscapes should be further identified and mapped.

THRIVING AND BALANCED COMMUNITIES OF PLANTS AND ANIMALS		
TARGET	**INDICATOR**	**STATUS**
By 2021 all elements of the marine food webs, to the extend that they are known, occur at natural and robust abundance and diversity By 2021, that the spatial distribution , abundance and quality of the characteristic habitat forming species, specific for each Baltic Sea sub-region, extends close to its natural range,	Percentage of all potentially suitable substrates covered by characteristic and healthy habitat forming species such as bladder wrack, eelgrass, blue mussel and stoneworts	
	Marine Trophic Index in the Baltic Sea	
By 2010 to halt the degradation of threatened and/or declining marine biotopes/habitats in the Baltic Sea, and by 2021 to ensure that threatened and/or declining marine biotopes/habitats in the Baltic Sea have largely recovered	Trends in abundance and distribution of rare, threatened and/or declining marine and coastal biotopes/habitats included in the HELCOM lists of threatened and/or declining species and habitats of the Baltic Sea area	
To prevent adverse alternations of the ecosystem by minimizing, to the extent possible new introductions of non-indigenous species	Trends in the numbers of detections of non-indigenous aquatic organisms introduced into the Baltic Sea	

What has been achieved so far?

All the Contracting Parties to HELCOM have signed the Bern Convention, which is a binding international legal instrument aiming at conservation of wild flora and fauna and their natural habitats. Contracting States which are also members of the European Community have to implement the Habitats Directive (43/92/EEC). The established BSPA, as well as the Natura 2000 and Emerald sites aim at protecting habitats and biotopes of the Baltic Sea. In addition HELCOM has identified the Baltic biotopes and habitats that are threatened and/or declining.

Information on invasive and alien species in the Baltic Sea has been well assessed including information on their vectors. The International Convention for the Control and Management of Ships' Ballast Water and Sediments has been adopted by IMO and the Contracting Parties to HELCOM are planning joint steps for its implementation.

Where are the gaps?

As diffuse transboundary pressures, such as eutrophication and hazardous substances are crucial to the state of underwater habitats and biotopes the establishment of protected areas is a necessary, but insufficient action to protect these. Pressures such as eutrophication must be addressed in order to attain a favourable conservation status of coastal, pelagic and benthic habitats and biotopes.

The few habitats and biotopes known for certain to be threatened and/or declining are not covered adequately by the existing network of Baltic Sea Protected Areas. No comprehensive information on distribution and abundance of rare, threatened and/or declining marine and coastal biotopes/habitats exists.

Let's join forces to reach the targets

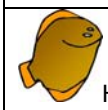
Eutrophication is the main reason for the current deviations from the targets for biotopes/habitats.

In order to properly assess the status of plant and animal communities, the distribution of underwater habitats and habitat forming species should be mapped. This includes identifying and mapping the potential and actual habitats formed by species such as bladder wrack (*Fucus* spp.), eelgrass (*Zostera marina*), blue mussel (*Mytilus* spp.), *Furcellaria lumbricalis* and stoneworts (Charales) as well as recruitment habitats for coastal fish using modelling among other tools, and to develop common approach for the mitigation of negative impacts, by 2013

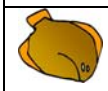
HELCOM should develop and adopt a new updated regional HELCOM Red lists of Baltic habitats/biotopes and biotope complexes.

Ratification of the IMO Ballast Water Convention is a step towards decreasing transfer of invasive and alien species. In addition, HELCOM should establish a co-operation on biological invasions with the Black Sea Commission and the Caspian Sea Environment Programme. Such activities are necessary in order to reduce the risk of species introductions beyond the IMO BWC requirements.

Photo: Metsähallitus 2005

VIABLE POPULATIONS OF SPECIES		
TARGET	**INDICATOR**	**STATUS**
By 2015, improved conservation status of species included in the HELCOM lists of threatened and/or declining species and habitats of the Baltic Sea area with the final target to reach and ensure favourable conservation status of all species By 2021, populations of all commercially exploited fish species are within safe biological limits, reach Maximum Sustainable Yield, are distributed through their natural range, and contain full size/age range By 2015, achieve viable Baltic cod populations in its natural distribution area in Baltic proper By 2015, to have the re-introduction programme for Baltic sturgeon in place, and - as a long term goal, after their successful reintroduction has been attained - to have best natural reproduction, and populations within safe genetic limits in each potential river	Trends in number of threatened and/or declining species	
	Abundance, trends and distribution of Baltic seal species compared to the safe biological limit (limit reference level) as defined by HELCOM HABITAT	 Ringed seal
		 Harbour and grey seals
	Abundance trends and distribution of Baltic harbour porpoise	
	Number of rivers with viable population of Baltic sturgeon	
	Spawning stock biomass of western Baltic cod and eastern Baltic cod compared to precautionary level (Bpa) as advised by ICES and/or defined by EC management plans	 Eastern Baltic Cod
	Trends in the age class structure and also fork length of the upper decile (largest 10%; or, as specified through scientific consultation) of indicator fish species caught in scientific surveys (including multiple trophic levels, such as cod, sprat, herring).	
By 2015 discards of fish are close to zero (<1%) By 2015 bycatch for harbour porpoise[1] seals, water birds and non-target fish species has been significantly reduced with the aim to reach bycatch rates close to zero	Trends in numbers of discards and by-catch of fish, marine mammals and water birds	
	Number of entangled and drowned marine mammals and water birds	

[1] Annual bycatch levels of harbour porpoises do not exceed two individual per year for the distinct eastern Baltic Sea population, be close to zero for the northern part of the Baltic Sea, and be reduced to below 1.7 % of the best population estimate for the Kattegat-Belt Sea population.

By 2015, as the short-term goal, to reach production of wild salmon at least 80 %, or 50 % for some very weak salmon river populations], of the best estimate of potential production, and within safe genetic limits, based on a inventory and classification of Baltic salmon rivers	Number of salmon rivers with viable stocks	
	Trend of salmon smolt production in wild salmon rivers	 Gulf of Bothnia
		 Gulf of Finland

What has been achieved so far?

HELCOM has adopted a priority list of threatened and/or declining species and a complete Red list for fish and lamprey species. The network of Baltic Sea Protected Areas, including seal sanctuaries protects threatened and/or declining species but also other management measures are necessary to bring threatened species to viable population sizes. E.g. the reproduction of white-tailed eagle has improved owing to the decrease in organic pollutants.

HELCOM has adopted recommendations to protect harbour porpoises, seals (including general management principles) and wild salmon. Banning of hunting of seals and the decrease in organic pollutants have made the increase in seal populations possible. The HELCOM *ad hoc* Seal Expert Group is currently quantifying Limit Reference Levels and Target Reference Levels for population sizes of seal species. Similar levels will be developed for seal distribution and health status. The Group is also assisting harmonisation of National Management Plans for the cross-boundary Baltic Sea Seal Management Units. ASCOBANS[2] has a comprehensive plan (Jastarnia Plan) for the recovery of harbour porpoise in the Baltic Sea, supported by HELCOM. The joint IBSFC[3] and HELCOM actions to protect wild salmon has resulted in an increase in wild salmon production and 37 salmon rivers have smolt production.

The reformed EC Common Fisheries Policy (CFP) of 2002 opened for long-term approach to fisheries management, including the establishment of multi-annual recovery plans for stocks outside safe biological limits. The EC has adopted (12 June 2007) a multi-annual plan for the cod stocks in the Baltic Sea.

Under the EU CFP, a number of Regional Advisory Councils (RACs), including the Baltic RAC, were established to give a possibility to Stakeholders, also environmental organisations, to comment - among other things - on draft total allowable catches (TACs) to be agreed by the Council. HELCOM has an observer status in the Baltic RAC.

A programme aiming at reintroducing sturgeon, the only recently extinct Baltic species, has started in the southern Baltic (Germany and Poland) but no introductions have been made so far.

Where are the gaps?

Information on abundance and distribution of rare species is scarce but according to the best available knowledge the network of Baltic Sea Protected Areas does not protect all species known to be threatened and/or declining; new areas must be established to ensure adequate protection.

Estimates of fish catch are uncertain and predominantly based on logbooks and landing declarations. Estimates of bycatches and entangled and drowned animals in fishing gears are incomplete. Further, a proper dialogue between the environmental and fisheries sectors is lacking.

[2] Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas

[3] International Baltic Sea Fishery Commission (ceased to exist 1st January 2007, replaced by bilateral Russian-EC negotiations)

Let's join forces to reach the target

HELCOM should develop and adopt a complete regional HELCOM Red list of Baltic species by 2011.

The already existing joint HELCOM work on management plans and management measures for Baltic seals, taking into account the safe biological limits and the ecosystem capacity, should be strengthened

The Contracting Parties should develop national management plans in order to ensure sustainable management of seals, other threatened and/or declining species and also fish species whose regulation falls within national competence.

Germany and Poland have started the re-introduction programme for Baltic sturgeon but the programme should be completed and extended to all potential rivers.

A coordinated reporting system and database on Baltic harbour porpoise sightings, bycatches and strandings, should be developed in co-operation with ASCOBANS by 2010

HELCOM has no mandate to manage fisheries in the Baltic Sea. It should anyhow be ensured that the Baltic Sea fishery is conducted in a sustainable way. The Baltic Sea should become a model of good management of human activities, where all fisheries management will be developed and implemented by using the Ecosystem Approach in order to enhance the balance between sustainable use and protection of marine natural resources. This can be reached through appropriate long-term management of Baltic Sea fisheries as provided by the EC Common Fisheries Policy and the bilateral fisheries agreement between the EC and the Russian Federation.

The measures include development of long-term management and/or recovery plans for commercially exploited fish stocks so that they are within safe biological limits and reach agreed targets, such as Maximum Sustainable Yield (MSY), are distributed throughout their natural range, and contain a full size/age-range, especially for cod, salmon, sea trout, pelagic species (sprat and herring), and flatfish species, by 2010;

The existing long-term management plans for cod and eel should be rapidly implemented, by 2009 at the latest;

To ensure that fisheries are managed in sustainable manner compatible with the environmental objectives of the HELCOM Baltic Sea Action Plan, an input to the 2012 review of the Common Fisheries Policy (CFP) should be elaborated by the Baltic Sea EU Member States together with the Russian Federation;

HELCOM should agree on a strategy for stakeholder dialogue in order to avoid potential, and mitigate existing, conflicts between fisheries and the protection of priority species. This has to be done in fora such as the Baltic RAC;

Illegal, unregulated and unreported (IUU) fisheries should be immediately eliminated and further landing control and other measures should be further developed, taking into account the outcome of the Baltic Sea RAC Conference on Control and Compliance in the Baltic in March 2007;

Measures to minimise by-catch of undersized fish and non-target species should be implemented by 2012. It should be also ensured that all caught species and by-catch which can not be released alive or without injuries are landed and reported

Spatial and/or temporal closures of fisheries to protect important areas for fish and also wintering sites of sea birds should be established by competent bodies (EC and Russia), where scientifically justified. In EC waters the areas should be created, protected and managed in conformity with EC Common Fisheries Policy but it should be noted that areas and periods closed for fishing are included in the EC's strategy for ensuring sustainable fisheries.

The Contracting Parties should also safeguard more weak wild salmon rivers populations in the Baltic Sea region than is done today and reintroduce salmon in potential salmon rivers.

Appropriate breeding and restocking practices for salmon and sea trout to safeguard the genetic variability of native wild stocks, should be further developed and applied by 2012 at the latest.

TOWARDS A FAVOURABLE STATUS OF BALTIC SEA BIODIVERSITY: AN OVERVIEW

Importance of biodiversity

Biodiversity determines the resilience, or the ability to adapt to changing circumstances, of ecosystems. Reduced diversity of genes, species and biotopes leads to ecosystems which are more vulnerable to the effects of natural variability and stochastic events. They also lose their buffering capacity against large-scale human disturbance, e.g. climate change. Many of the Baltic species are genetically distinct from their marine or freshwater source populations and can not be replaced once driven to extinction.

A diverse and well functioning marine ecosystem is necessary to maintain future sustainable use of the Baltic Sea. Socio-economic values emerging from the Baltic ecosystem, linked to recreational, cultural and aesthetic aspects of our sea, are important to man and form a part of our joint natural heritage.

Many of the ecological objectives under the other three strategic goals, pertaining to eutrophication, hazardous substances and maritime activities, are also relevant to biodiversity. The favourable status of biodiversity cannot be reached without having e.g. “natural oxygen levels”, a “natural level of algal blooms”, a “natural distribution and occurrence of plants and animals”, “healthy wildlife”, and “no introduction of alien species”.

Biodiversity of the Baltic Sea

The Baltic Sea is one of the largest brackish water bodies in the world. Relatively few animal and plant species have been able to adapt to the brackish water environment compared to marine and freshwater ecosystems. However, there is a unique combination of marine and freshwater species acclimatised in the Baltic Sea. The number of marine species decreases towards north and north-east while the trend in freshwater species is the opposite. Many of the Baltic species are genetically distinct from their marine or freshwater source populations.

The naturally low number of species in the Baltic Sea underlines the importance of the well-being of populations of all native organisms. As there is very little functional redundancy[4] in the Baltic Sea ecosystem, many Baltic Sea species can be treated as keystone species[5]. The removal of just one species can have more of an impact here than in areas with high functional redundancy. Although only one species, the sturgeon (*Acipenser sturio*), has become extinct in the Baltic Sea in recent history, there have been observed reductions in the abundance, range and distribution of several other species.

Quantitative definitions of biodiversity –difficult but obligatory for EC members

The process of setting quantitative target values for biodiversity topics is not only going on within HELCOM but also necessary to fulfil the requirements of the EC Habitats Directive (43/92/EEC). The overall objective of the Directive is to achieve and maintain favourable conservation status (FCS) for all habitats and species of Community interest and to contribute towards maintaining biodiversity of natural habitats and of wild fauna and flora in the European territory of the Member States. In simple words FCS can be described as a situation where a habitat type or species is prospering (in both quality and extent/population) and with good prospects to do so in future as well.

In the obligatory reporting of the Habitats Directive, Favourable Conservation Status is recommended to be assessed in the context of clear, measurable reference values or Favourable Reference Values (FRV). Three types of such FRVs are to be defined: Favourable Reference Areas (FRA) for habitats, Favourable Reference Populations (FRP) for species and finally Favourable Reference Ranges (FRR) for both species and habitats. The Habitats Directive reporting guidelines acknowledge that in many cases delineating FRVs is quite difficult, but that in

[4] Functional redundancy refers to species that share the same function in the ecosystem and thus can replace one another to some extent.

[5] A keystone species can be defined as a species that plays a large or critical role in supporting the integrity of its ecological community and whose role in maintaining ecosystem function is greater than would be predicted based on its abundance.

these cases expert judgement has to be used as a starting point. The initial FRVs devised by expert judgement will have to be improved with better understanding and further data, e.g. as a result of monitoring. However, for all Favourable Reference Values it is possible to carry out an assessment of Conservation Status by setting the FRV 'greater than present day value'.

According to guidelines the reporting should be done on a bioregional scale, even if also more detailed information can be included. Collection of information related to e.g. mobile marine species should be shared between neighbouring Member States to avoid potential double counting of populations and provide better judgements on range. Considering this strong emphasis on regional co-operation, there is a clear need for joint regional Baltic Sea efforts, e.g. the HELCOM biodiversity and nature conservation assessment activity to implement European biodiversity policies.

Herring. Riku Lumiaro, FIMR

NATURAL COASTAL AND MARINE LANDSCAPES

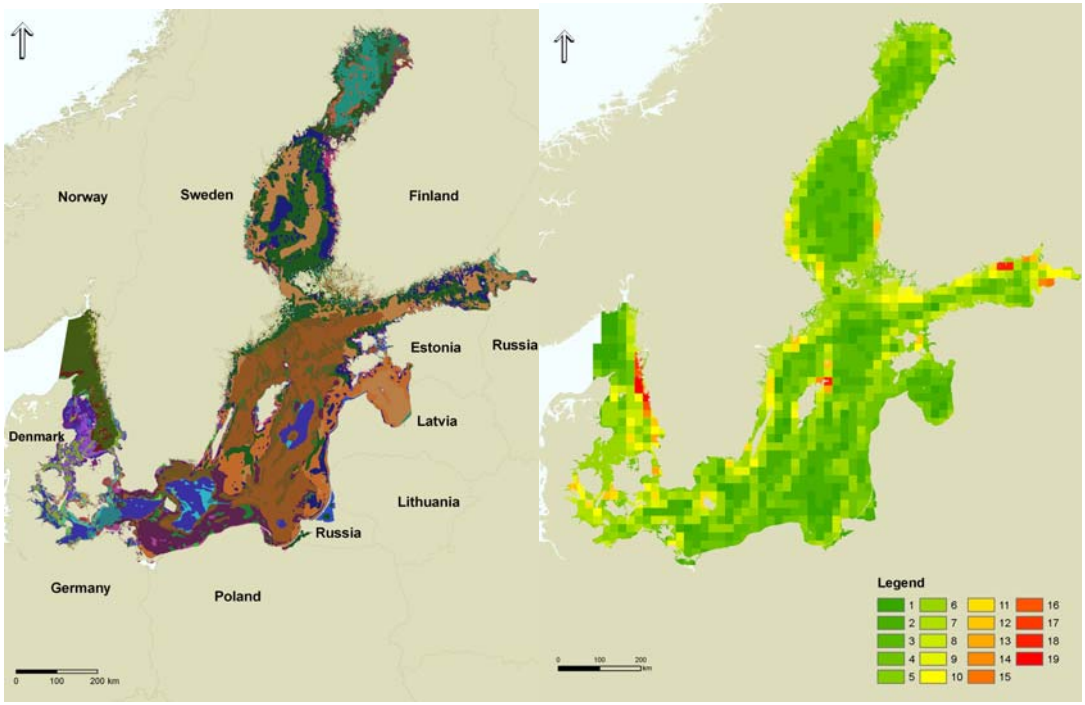
This objective aims at maintaining and restoring natural marine, coastal, and adjacent terrestrial landscapes. It addresses the overall functioning and resilience of marine ecosystems and their services, the regenerative capacity of natural resources and their sustained availability for human use, as well as the characteristic features and aesthetic values of coastal and marine landscapes. This includes restoring and maintaining sea floor integrity at a level that the functions of the ecosystems are safeguarded.

These targets can be achieved through the completion of an ecologically coherent and well-managed network of coastal and offshore BSPAs, Natura 2000 areas and Emerald sites. The 2003 joint HELCOM/OSPAR Ministerial Meeting set 2010 as a deadline for the completion of the network. It should be noted that the ecological coherence is a concept which is presently without a solid definition, and therefore analysing ecological coherence and giving comprehensive results is difficult.

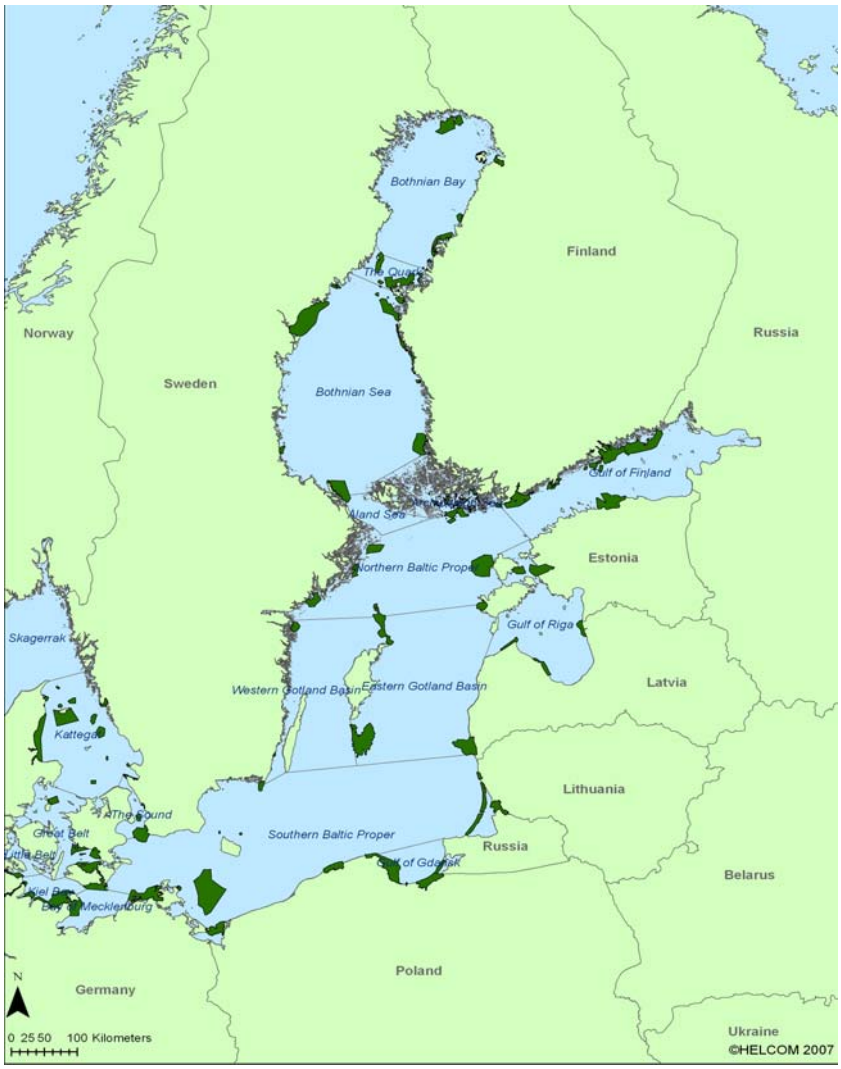
HELCOM has a target "by 2010 to have an ecologically coherent and well-managed network of Baltic Sea Protected Areas (BSPAs), Natura 2000 areas and Emerald sites in the Baltic Sea". In order to be ecologically coherent, the network should protect areas with:

1. Threatened and declining species and habitats
2. Important species and habitats
3. Ecological significance
    a. A high proportion of habitats of migratory species
    b. Important feeding, breeding, moulting, wintering or resting sites
    c. Important nursery, juvenile or spawning areas
    d. A high natural biological productivity of the species or features being represented
4. High natural biodiversity
5. Rare, unique, or representative geological or geomorphological structures or processes.
6. High sensitivity

The benthic landscape maps and the benthic complexity map below give guidance on the benthic diversity. Comparison between the spatial distribution of benthic complexity and the BSAPs indicate that the network is not always designed to take into account the benthic diversity.



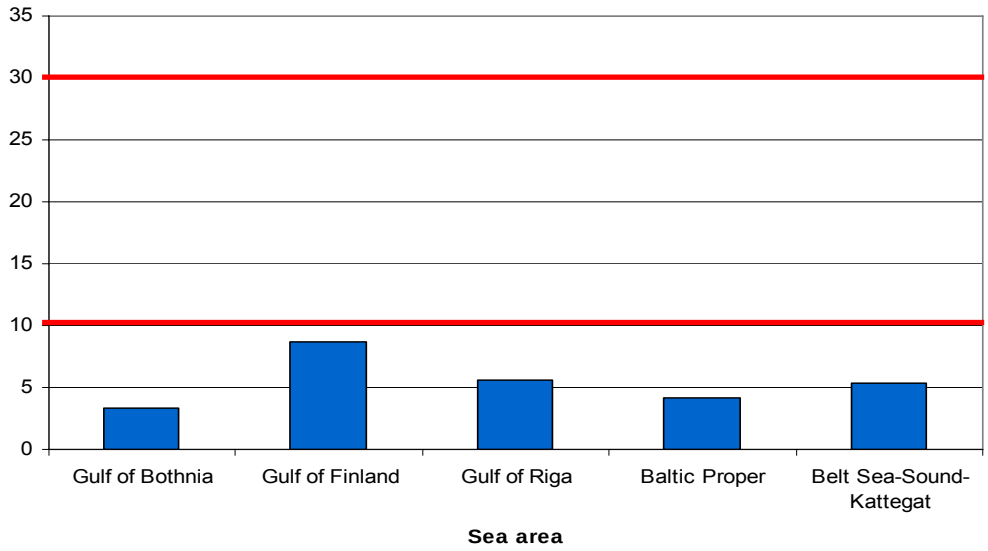
Left: Benthic marine landscape map of the Baltic Sea.
Right: Map showing the number of benthic marine landscapes within a 20km grid.
Source Al-Hamdani & Reker 2007



86 officially notified and designated Baltic Sea Protected Areas.

Photo: Metsähallitus 2005

Designated BSPAs, Natura 2000 and Emerald site areas as a percentage of total sub-region areas



The percentage of sea area covered by BSPAs, including reported Natura and Emerald sites of each sub-region of the Baltic Sea. Note: for the Gulf of Bothnia, Baltic Proper and Belt Sea-Sound-Kattegat area information is missing for three (Sweden), nine (five from Germany, three from Sweden and one form Russia) and four sites (two from Germany and two from Sweden), respectively.

The majority (89%) of the 86 notified and designated BSPA sites are terrestrial or coastal within the territorial waters. Only Denmark and Germany have designated sites that are situated entirely in offshore EEZ waters (one site for each). Denmark and Lithuania have two sites, and Sweden one site that is partly situated within their EEZ.

HELCOM Recommendation 15/5 urges countries to establish and implement management plans for each BSPA and also evaluate and review their effectiveness. The requirement of “sustainable use of natural resources as an important contribution to ensure ample provident protection of environment and biodiversity” included in the Recommendation requires clear management of the sites. Only about one third of the present BSPA sites have a management plan, and one third has one under preparation.

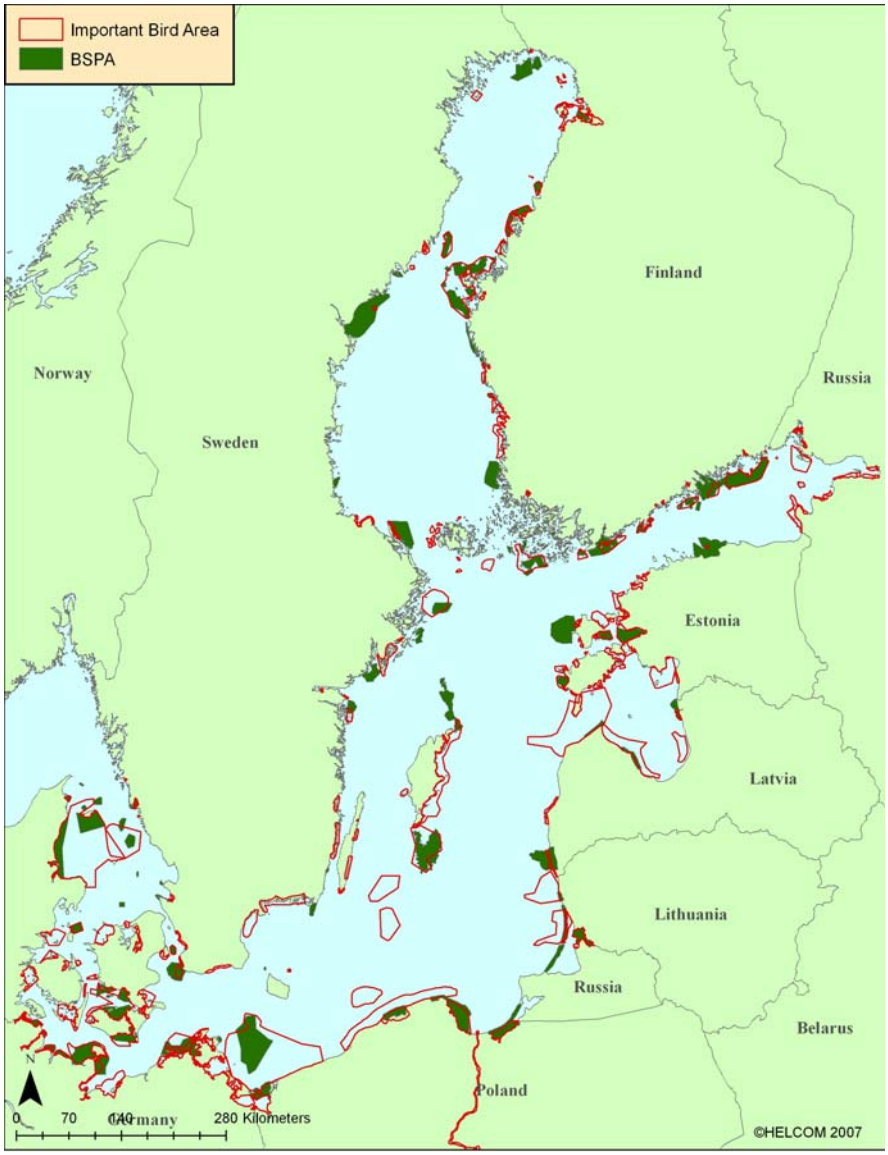
To maintain the diversity of ecosystems, habitats and biomes the UN WSSD Johannesburg Declaration and the Convention on Biological Diversity (COP 7) has adopted targets to develop a representative network of marine and coastal protected areas by 2012 with the goal of “at least 10% of each marine and coastal ecological region globally effectively conserved”. All HELCOM Contracting Parties have adopted these targets but so far the 10 per cent target is not reached in any Baltic sub-region (c.f. the figure above). Currently the BSPAs cover approximately 5.4 per cent of the Baltic Sea marine area. If all the sites in the HELCOM BSPA Database would be designated the total marine area protected would be roughly 7 per cent. However information on non-terrestrial surface area (islets and open water) is missing for three sites in the Gulf of Bothnia (Sweden), nine sites in the Baltic Proper (four in Germany, three in Sweden and one in Russia), and for four sites in the Belt Sea-Sound-Kattegat (two in Germany and Sweden).

At the moment almost all, 99%, of the officially designated BSPAs are also Natura 2000 sites. A comparison between the HELCOM BSPA database and the EUNIS Database (http://eunis.eea.europa.eu/) shows that several marine Natura 2000 sites have not been designated as BSPAs

Based on the current, albeit incomplete information on the sites and the network, the BSPA network does not at present fulfil the criteria for an ecologically coherent network. However, even if incomplete, the notified and designated BSPAs and other sites (including e.g. BSPAs proposed by Recommendation 15/5) is a good basis for a network of areas protecting representative

ecosystems, biotopes, habitats and species. Information on these sites is available in the HELCOM BSPA Database.

Percentage of important migration and wintering areas for birds within the Baltic Sea area which are covered by the BSPAs, Natura 2000 and Emerald sites



Important Bird Areas (IBAs) and officially notified and designated Baltic Sea Protected Areas (BSPAs). Total number of IBAs: 227, total number of designated BSPAs: 86.

In total 227 Important Bird Areas (IBAs) are defined in the Baltic Sea by Bird Life International. Of these 227 sites, only 37 are totally and 26 partly covered by BSPAs. However, information on how the IBAs are protected by other means has not been assessed. This includes sites protected by national legislation or other means (e.g. private protected areas).

Number of BSPAs protecting threatened and/or declining species

According to the latest compilation by HELCOM (2006), populations of several plant and animal species are declining or the species are threatened and are thus in need of special protection (cf. Annex 1).

Currently 30 species of the 61 listed as threatened and/or declining are included in the protection objectives of the BSPA network as shown in the table below and in more detail in Annex 1[6].

Number of species by group in the HELCOM list of threatened and/or declining species and habitats/biotopes of the Baltic Sea Area and number of these species protected within BSPAs and number of those sites.

Species group	Number of threatened and declining species	Number of species present in the BSPAs	Number of BSPAs where the species exist
Algae	10	2	4
Vascular plants	4	2	7
Invertebrates	7	0	0
Fish	23	9	15
Birds	13	13	53
Mammals	4	4	26
Total	61	30	

The BSPA network aims to protect all bird and mammal species listed by HELCOM as threatened and/or declining. Other species groups are not that well represented in the protection objectives of the existing BSPAs. In general, the majority of the species protected by the BSPA network are terrestrial, or birds. Protection of marine species, habitats and biotopes is inadequate by the present though “marine values” are among the most frequent selection criteria. In majority of the BSPAs, the protection of important submerged habitat building species has not been the basis of designation.

Photo: Metsähallitus 2004

[6] Note: the BSPA Database includes information on species from 65 sites only, although there are 86 officially designated BSPAs in the network.

THRIVING AND BALANCED COMMUNITIES OF PLANTS AND ANIMALS

Thriving and balanced communities of plants and animals are essential for the favourable status of the Baltic Sea biodiversity. This includes the well-known bladder wrack and eelgrass biotopes of the coastal zone but also other less well known biotopes, as well as other types of communities such as the free-floating organisms of the open sea.

Changes in the structure of communities have cascading effects on their associated species and the ecological function of the ecosystem. For example, changes in plankton communities can have effects on entire food chains and eutrophication fuelled blooms also affect other pelagic and benthic communities.

Introduction of non-native species is another threat to the Baltic biodiversity which is difficult to manage by the available methodology. Ballast water treatment may be one way to stop the present influx of alien species.

The aim of this HELCOM ecological objective is that habitats, including associated species, show a distribution, abundance and quality in line with prevailing physiographic, geographic and climatic conditions.

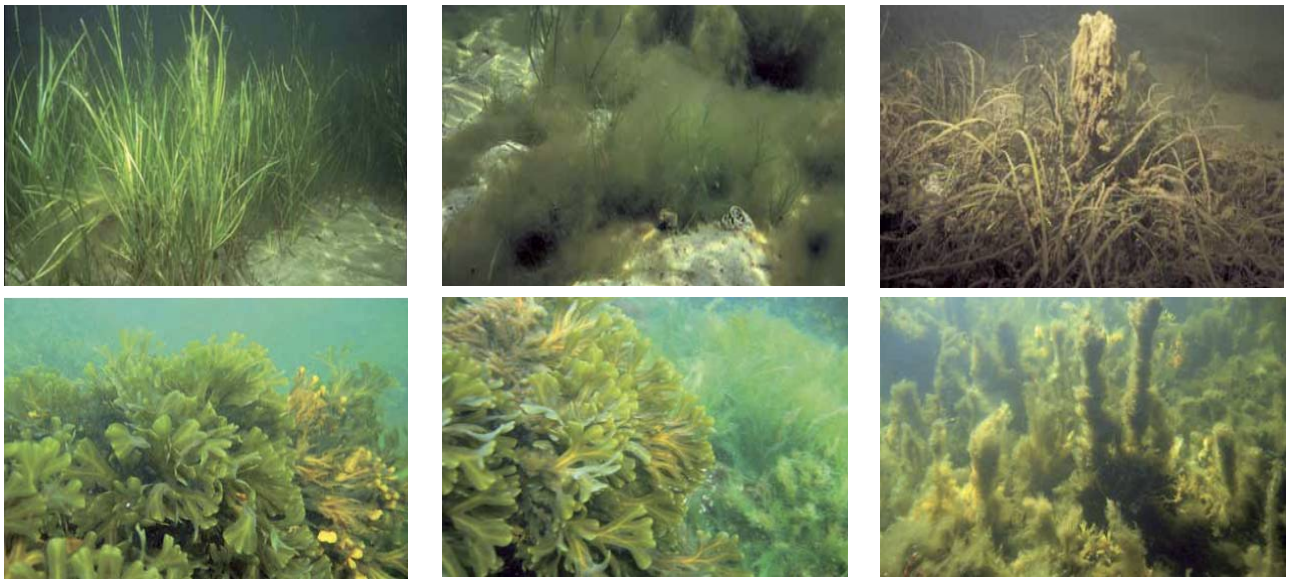
Bladder wrack, eelgrass, stonewort and mussel beds

Percentage of all potentially suitable substrates (sea floor) covered by characteristic and healthy habitat forming communities of bladder wrack, eelgrass, blue mussel and stoneworts

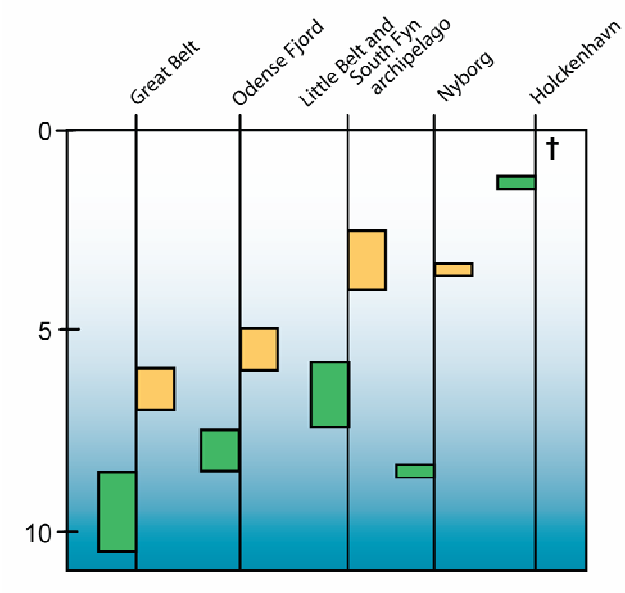
While all species and habitats are of HELCOM interest, initial focus will be on major habitat forming species, i.e. bladder wrack (*Fucus vesiculosus*), eelgrass (*Zostera marina*), blue mussel (*Mytilus trossulus, Mytilus edulis*) and stoneworts (Charales) as well as recruitment habitats of coastal fish.

During the last decades, the occurrence of both bladder wrack and eelgrass has declined dramatically mainly due to the effects of eutrophication: decreasing water transparency, increasing sedimentation and increasing amounts of fast growing filamentous algae (e.g. Boström et al. 2002, Berger et al. 2003, and references therein). Due to the increase in turbidity of water, bladder wrack and eelgrass are not able to grow at as great depths as before. The shallower growing depths make bladder wrack belts more susceptible to physical disturbances, e.g. ice scouring.

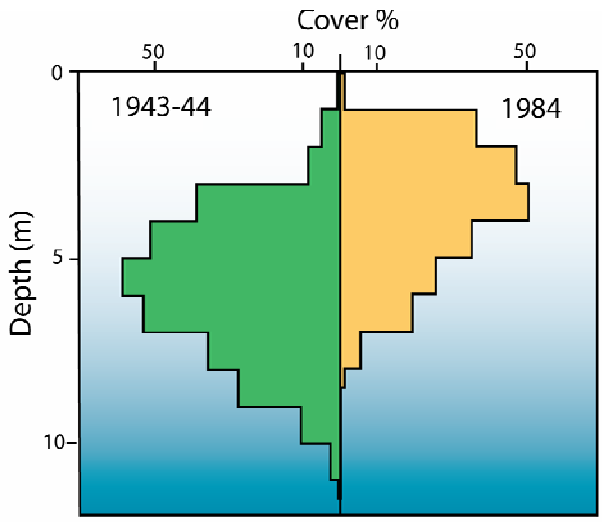
Long-term data on depth distributions has revealed marked declines in the depth limits of bladder wrack (Torn et al. 2005).



Changes in eelgrass (upper row) and bladder wrack density and epiphyte biomass with increasing eutrophication.
Photos by Nanna Rask (Funen County) and Georg Martin (University of Tartu).



Depth distribution of eelgrass in five different stations within Danish waters in 1908 (green boxes) and in 1996-98 (yellow boxes). The cross in the Holckenhavn site means that eelgrass has disappeared completely (redrawn from Madsen et al. 2001).



Average depth distribution and areal coverage of bladder wrack in 1943/44 (9 stations, green area) and 1984 (10 stations, yellow area) in Swedish coasts of Åland Sea, northern Baltic Proper. (redrawn from Kautsky et al. 1986)

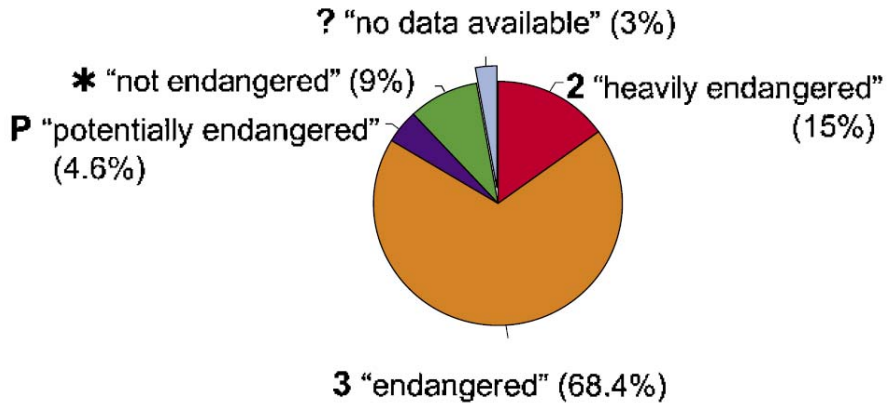
Monitoring and modelling are both required in order to assess how the target "percentage of all suitable substrate covered by typical and healthy habitat forming communities of bladder wrack, eelgrass, blue mussel and stoneworts" has been reached. Modelling can estimate the extent of potential growth areas by combining known environmental variables in a spatial context. Monitoring is needed to obtain information on present distribution of these habitat-forming species. Currently, information on the changes of bladder wrack and eelgrass is available only locally.

Although signs of recovery have recently been observed in the occurrence of bladder wrack in some areas (Nilsson et al. 2004), both bladder wrack and eelgrass communities currently deviate from the HELCOM Objective of "natural distribution and occurrence of plants and animals" and the communities are neither thriving nor balanced. Seagrass (macrophyte) beds are considered heavily endangered in all sub-regions of the Baltic Sea except in the Bothnian Bay, the Quark and the Finnish waters of the Bothnian Sea and the Gulf of Finland. Bladder wrack is listed as threatened and/or declining in south-eastern Gulf of Finland, in the Gulf of Gdansk and Kiel Bight by HELCOM (2006). Eelgrass is listed threatened and/or declining in the south-western Baltic Sea including the Belts, the Sound and the Kattegat.

Abundance and distribution of rare, threatened and/or declining marine and coastal biotopes/habitats included in the HELCOM lists of threatened and/or declining species and habitats of the Baltic Sea area

Comprehensive information on abundance and distribution of rare, threatened and/or declining marine and coastal biotopes/habitats included in the HELCOM lists of threatened and/or declining species and habitats of the Baltic Sea area does not exist. However, based on expert judgements, threats to marine biotopes/habitats can be estimated (Annex 2).

The overall assessment of the threats to the marine and coastal biotopes of the Baltic Sea area (HELCOM 1998) gives cause for concern: the majority of all biotopes is rated as endangered or heavily endangered. This result clearly reflects the heavy adverse impacts that human activities have on costal and marine biodiversity, although no biotope or biotope complex is rated as "completely destroyed" or "immediately threatened". According to the HELCOM list of threatened and/or declining species and habitats/biotopes of the Baltic Sea Area (HELCOM 2006), heavily endangered or endangered habitats and biotopes exist in all subdivisions of the Baltic Sea (Annex 2).



Percentage of different threat categories for the biotopes of the Baltic Sea, the Belt Sea and the Kattegat.

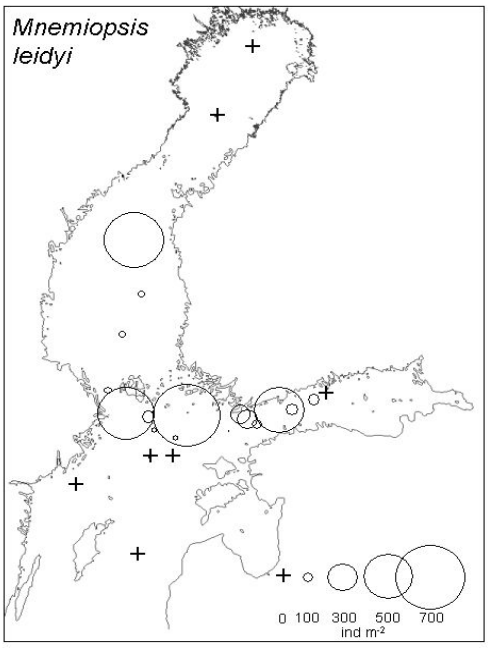
Number of newly introduced alien aquatic species in the Baltic Sea

Number of established invasive and alien aquatic species in the Baltic Sea

More than 120 invasive and alien species have been recorded in the Baltic Sea (including Kattegat), most of them having being introduced during the last 100 years and with shipping as the main vector. Some 60-70 species have established reproducing populations in the Baltic or at least in some parts of it (Baltic Sea Alien Species Database 2005). It is clear that so far the HELCOM objective "no introduction of alien species" has not been reached. The rate of new introductions has remained stable or even increased during the last decades, which is concurrent with the increasing shipping activity in the Baltic Sea.

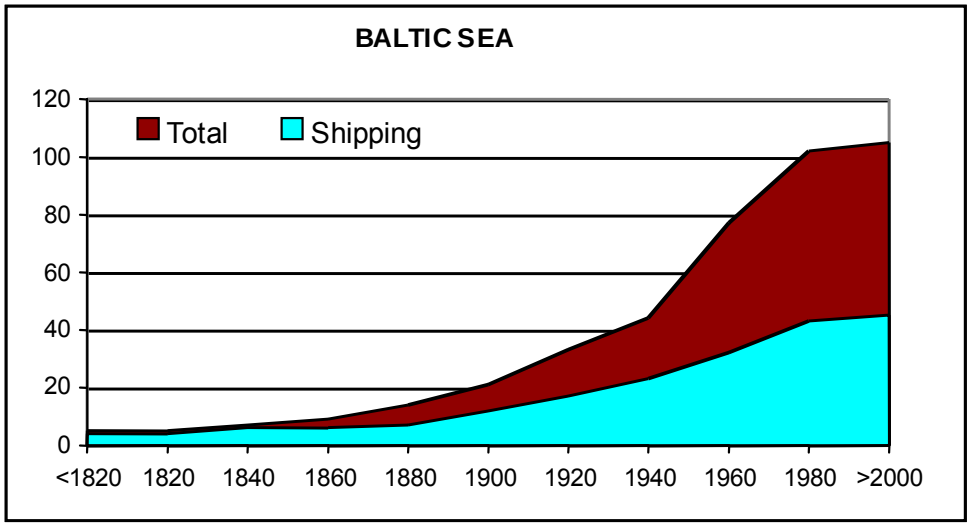
Alien species may change the native food web and some are known as ecosystem engineers, which cause substantial habitat modifications. There are also numerous cases worldwide where invasive species have even replaced native species, thus severely impacting biodiversity by threatening the uniqueness of local ecosystems. It is not only the environment being at risk, also economical and human health issues have been reported, e.g. during harmful algal blooms and human consumption of contaminated seafood. Already established invasive species have e.g. caused major alterations in soft-bottom macrobenthos (*Marenzelleria spp*.), fouling of fishing gears, (*Cercopagis pengoi*) ship hulls and industrial cooling water systems (*Balanus improvisus, Cordylophora caspia* and dreissenid mussels).

The American comb jelly *Mnemiopsis leidyi*, which wiped out fish populations in the Black Sea during the 1980s-1990s, invaded the southern Baltic Sea in October-November 2006, and was found from the western part of the Gulf of Finland, the northern Baltic Proper and the Bothnian Sea in August-September 2007. It was very abundant in the water layers around halocline (max. 694 ind m-2), and was observed to reproduce effectively. If this species establishes itself in the Baltic Sea this can mean considerable losses for fisheries, in addition to being catastrophic for the ecosystem.



The occurrence and abundance of the American comb jelly (Mnemiopsis leidyi) in the northern Baltic Sea in August-September 2007 (Lehtiniemi and Flinkman 2007)

The Baltic Sea countries have international obligations to address the invasive alien species problem, principally according to the 1992 Convention on Biological Diversity and, concerning marine areas, the 2004 International Convention for the Control and Management of Ships' Ballast Water and Sediments by IMO.



Cumulative number of first records of invasive and alien species in the Baltic Sea (105 speceis, based on Baltic Sea Alien Species Database, 2005) and the share of ship-mediated introductions since the early 1800s.

Additional indicators for thriving and balanced communities of plants and animals

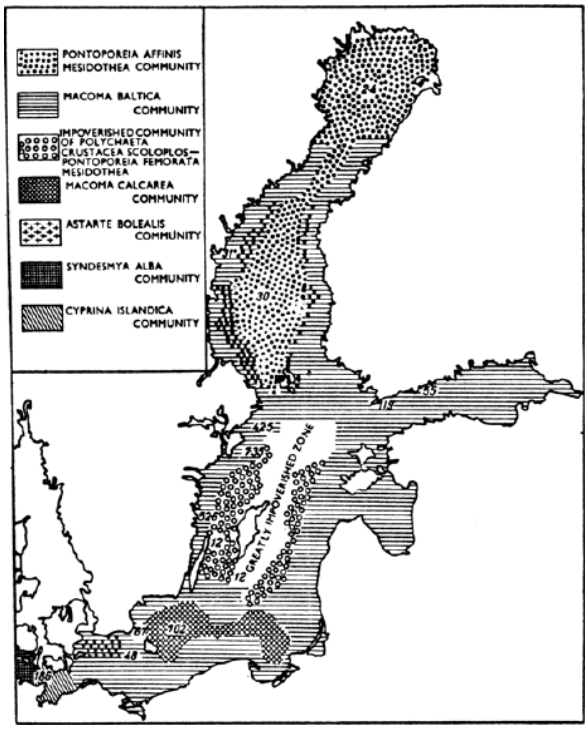
Bottom fauna communities

Macrozoobenthic communities are central elements of the Baltic Sea ecosystem and providing important ecosystem services and constituting excellent indicators of environmental health.

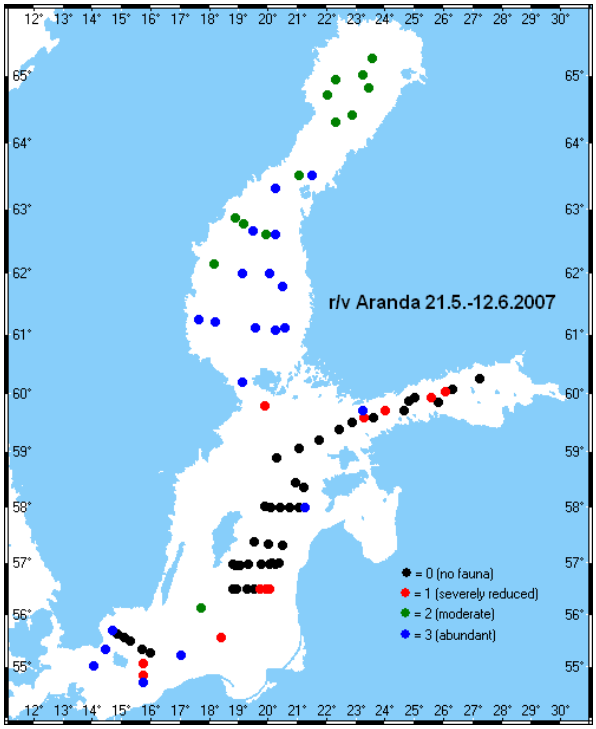
The deeper water soft bottom communities are exposed to hypoxic disturbance events due to eutrophication and the hydrographic characteristics of the Baltic Sea. Macrobenthic communities are severely degraded throughout the Baltic Proper and the Gulf of Finland and biomass is below the long-term average. The once-abundant bivalves *Astarte* and *Arctica islandica* have nearly disappeared from Baltic Sea proper bottoms. Further, populations of the amphipod *Monoporeia affinis* have declined severely in the Gulf of Bothnia and the invasive polychaete *Marenzelleria spp.* has extended its distribution. Due to these changes the structure of food webs has been altered in the Baltic

deep basins. Similarly, more shallow coastal benthic communities have increasingly been subjected to eutrophication effects including organic enrichment and hypoxia; these effects are pronounced in the sheltered archipelago waters of the northern Baltic Sea.

The present state of bottom fauna communities is far from the HELCOM ecological objective "natural distribution and occurrence of plants and animals" and especially the communities below the halocline are neither thriving nor balanced.



Baltic zoobenthic softbottom communities in 1950s (Zenkevitch 1963).



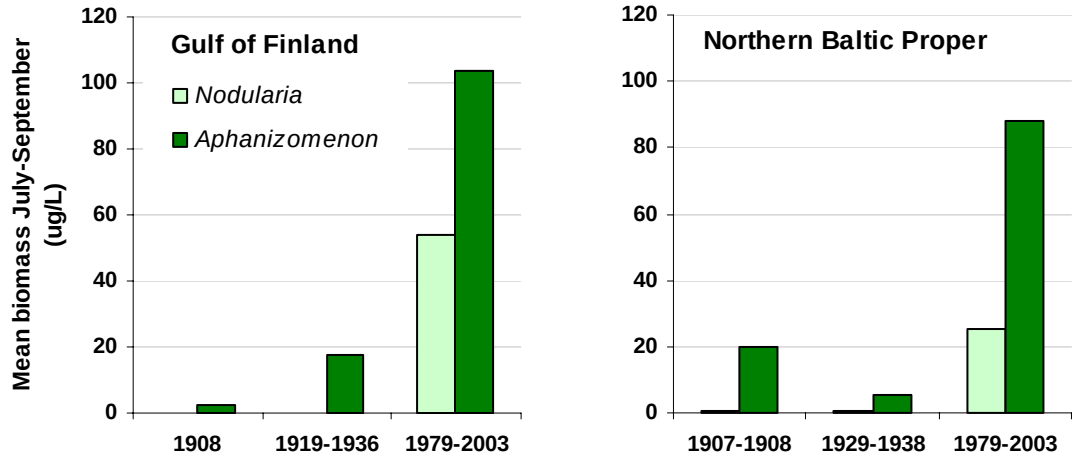
State and trends of macrozoobenthic communities in open sea areas of the Baltic Sea in 2007 (Finnish Institute of Marine Research 2007, unpublished material).

The phytoplankton community and algal blooms

Under the goal for eutrophication, HELCOM has the ecological objective "natural level of algal blooms", which is valid for the biodiversity goal also. This includes phytoplankton species which have fundamental effects on the whole food web as primary producers.

As an example, mean late summer biomass of the bloom-forming cyanobacteria (blue-green

algae) *Nodularia spumigena* and *Aphanizomenon* sp. in the Gulf of Finland and the Northern Baltic Proper have increased several-fold since the first half of the 20th century. Another alarming new development are the occurrence of toxic dinoflagellate blooms (esp. *Alexandrium ostenfeldii*) in coastal areas of the Baltic Sea Currently, the phytoplankton communities deviate from the HELCOM objective "balanced communities of plants and animals" and "natural level of algal blooms".



Mean late summer biomasses of Nodularia spumigena and Aphanizomenon sp. Data for the years 1907-1938 were recalculated from units of 100 µm/L in Finni et al. (2001, Table 4) to biovolume units (μm^3) using the biovolumes for Aphanizomenon sp. and Nodularia spumigena (size class 2), respectively, in Olenina et al. (2006). The biovolumes were then converted to biomasses (µg/L) assuming one cyanobacterial μm^3 weighs 10^{-6} µg. Data for 1979-2003 from Suikkanen et al. (2007, Table 3).

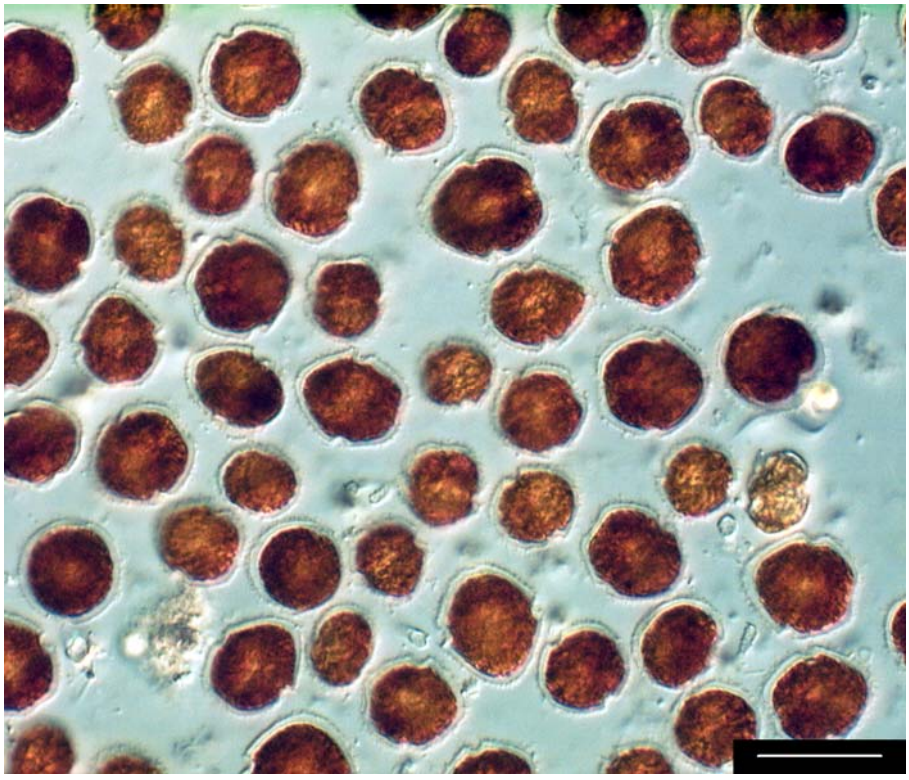


Photo: Seija Hällfors, FIMR

VIABLE POPULATIONS OF SPECIES

A viable population consists of a successfully breeding, healthy population that is able to maintain itself and perform its functional role in the community and ecosystem. The population trends of certain species, such as seals, white-tailed eagle, salmon and cod, are well known due to long-term studies, and can be used as indicators of the health of wildlife.

HELCOM has the general aim to have a favourable conservation status of plants and animals in the Baltic Sea and that they occur at normal abundance and diversity. This requires improved abundance and distribution of rare, threatened and/or declining marine animal and plant species in intact habitats. Actions needed to reach this target include addressing nutrient and hazardous substances inputs, maritime issues such as the threat of oil spills, introduction of alien species and fisheries. The HELCOM target is to reach this state by 2021.

Number of threatened and/or declining species

According to the latest compilation by HELCOM (2006, cf. Annex 1), populations of 61 plant and animal species are declining or the species are threatened and are thus in need of special protection. Since the list is the first of its kind compiled by HELCOM, it does not provide information on changes in the number of species threatened or declining.

As an example, changes in bird populations in the Baltic Sea are a relatively well-known due to the active networks of birdwatchers. HELCOM HABITAT 5 (2003) made a simple summary indicating the trends in numbers of breeding waterbirds in the Baltic Sea between 1985 and 2002. The HELCOM list of threatened and/or declining species contains 13 birds of which seven were assessed by HELCOM HABITAT 5 as follows:

Species	Overall trend in 1985-2002
Velvet scoter	Decrease 1-5%
Red-breasted merganser	Relatively stable
Caspian tern	Relatively stable
Sandwich tern	Decrease 5-10%
Little tern	Decrease 1-5%
Lesser black-backed gull	Decrease 1-5%
Black guillemot	Increase 1-5%

White-tailed eagle was considered endangered in the beginning of 1980s due to reproduction failures linked to DDT and PCBs. Today the species does not belong in the HELCOM list of threatened and/or declining species. Protection of the white-tailed eagle is included in the objectives of 30 BSPA sites.

Abundance of Baltic seal species compared to the favourable conservation status

The Baltic seal populations consist of grey (*Halichoerus grypus*), ringed (*Phoca hispida bothnica*), and harbour seals (*Phoca vitulina*). Two genetically distinct harbour seal populations occur in the Baltic Sea in the Kalmarsund region and in the South western Baltic, respectively. There are no sub-regional grey seal populations in the Baltic Sea, and genetic investigations indicate low or no diversification between ringed seal sub-populations.

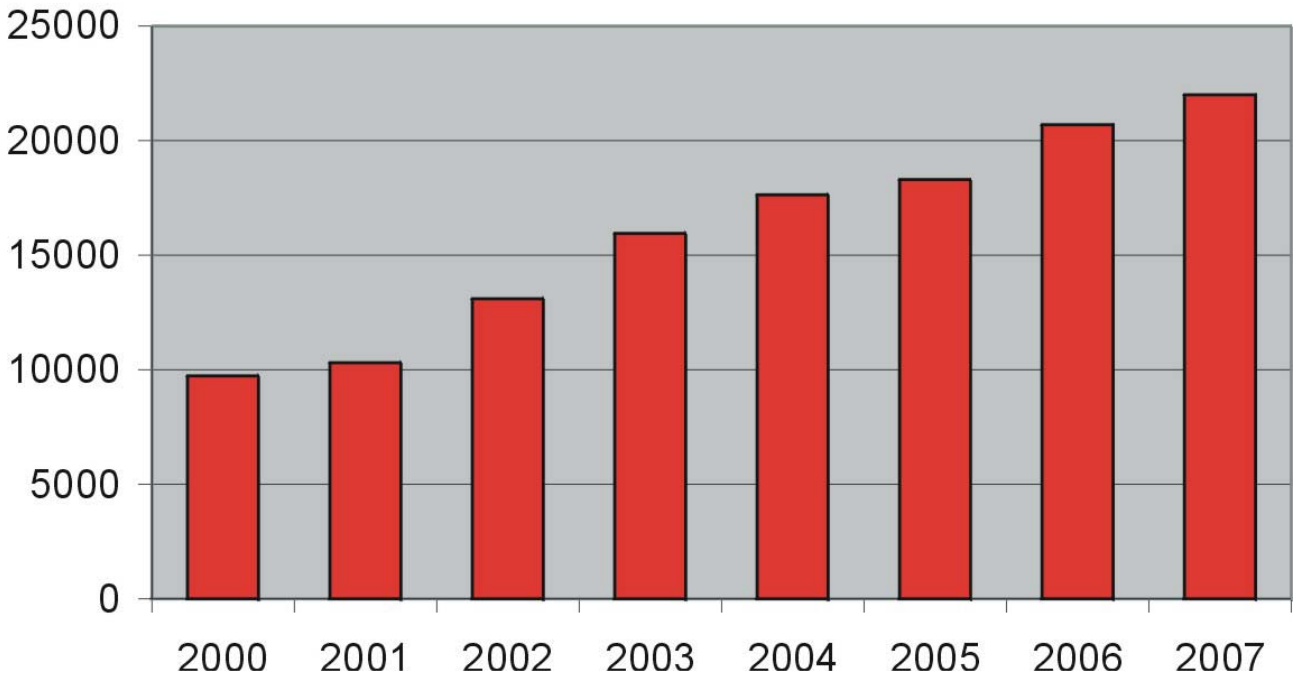
The majority of ringed seals (75%) live in the Bothnian Bay, ca. 15% in the Gulf of Riga. A small amount of ringed seals exists in the Archipelago Sea (Helle 1980a, Helle & Stenman 1990, Härkönen et al. 1998, Miettinen et al. 2005, Stenman et al. 2005b) and in the Gulf of Finland. Ringed seals are highly dependent on ice during the breeding and moulting. Most of the grey seals inhabit the sea area north of 58°N (passing through the northern tip of Gotland).

Seal populations in the Baltic declined markedly during the first half of the 20th century due to an excessive hunting pressure. In addition to hunting, the seal populations have been exposed to a

considerable contaminant load (mainly PCB and DDT) since the 1960s. As a result of a ban of hunting, the abundance of Baltic seals is generally increasing since their lowest levels in the 1960s - beginning of the 1980s.

In the beginning of the 20th century, it has been estimated by modelling that the grey seal population could have amounted to ca. 100 000 individuals. The population size was estimated in 1970s-1980s to consist only 2 000-4 000 seals. The current grey seal population size exceeds 20 000 individuals (international counting in 2007). According to Helle et al (2005), at present grey seals of the northern Baltic Sea area show a reproductive rate comparable to a healthy population.

In the beginning of the 20th century, it has been estimated by modelling that the ringed seal population amounted to ca. 200 000individuals. In the 1970s-1980s the population was estimated to only 5000 seals. According to the latest comprehensive seal counting in 1996, the size of ringed seal population was 5600-6000 individuals (Härkönen et al. 1998). The annual increase of the population in the Bothnian Bay is ca. 5%, which is half of the increase rate estimated for a stable population (Härkönen et al. 1998). The other populations (Bothnia Sea, Archipelago Sea, Gulf of Finland and Gulf of Riga) are expected to increase even slower. Reproduction failures are considered to be the main reason for the low reproductive rate. However, the occurrence of uterine occlusions in females, the main explanation for the impaired reproductivity, is showing a clear decreasing trend in the Bothnia Sea (Helle et al 2005. Since ringed seal reproduction is highly dependent on ice, the projected decrease of ice cover due to climate change pose a future threat to the ringed seal (HELCOM 2007). On the other hand, ringed seals have been occasionally observed to reproduce on the shores of small islands and skerries in the Archipelago Sea. However, the reproductive success may be hampered by high pup mortality, a subject that requires further investigation.



Population change of grey seals in the Baltic Sea in 2000-2007 (Source: Finnish Game and Fisheries Research Institute and the international seal counting expert group). Preliminary analyses based on genetic modelling suggest the Limit Reference Level to be in the vicinity of 10000 seals, but considerable additional work is required to determine more precise LRLs for different species and management units of seals taking into account differences in demography and habitats (HELCOM SEAL 1/2006).

Predation pressure by seals on fish such as herring and salmon are potentially important in the northern Baltic Sea (ICES 2006). The impact of seal predation on the herring in the Bothnian Sea have been investigated and found to have very limited impact on stock dynamics at present.

Trend of abundance and distribution of Baltic harbour porpoise

The only toothed whale (cetacean) encountered in the Baltic on a regular basis is the harbour porpoise (*Phocoena phocoena*).

At the beginning of the 20th century, 10000-20000 porpoises lived in the Baltic Proper, their distribution ranging as far as the eastern Gulf of Finland and the Bothnian Bay. Currently, the population in the Baltic Proper is estimated to number only some 600 individuals and the species is very rare in the northern and easternmost parts of the Baltic Sea. In Skagerrak and Kattegat, however, there are about 36000 individuals, and this population is important on a European scale.

Today, fisheries bycatch represents a major threat to the recovery of the Baltic harbour porpoises. The annual bycatch of harbour porpoise is roughly estimated as 7-10 individuals. According to ICES (2006) fisheries bycatches amount to 0.5–0.8% of the porpoise population in the south-western part of the Baltic Marine Area each year, as well as 1.2% of the porpoise population in the Kiel and Mecklenburg Bays and inner Danish waters (Kock and Behnke 1996). Estimates of the harbour porpoise population are uncertain, however, and the number of porpoises by-caught in fisheries is probably underestimated. The loss of porpoises to fishery in the Baltic Marine Area may be too high to sustain the population (ICES 1997).

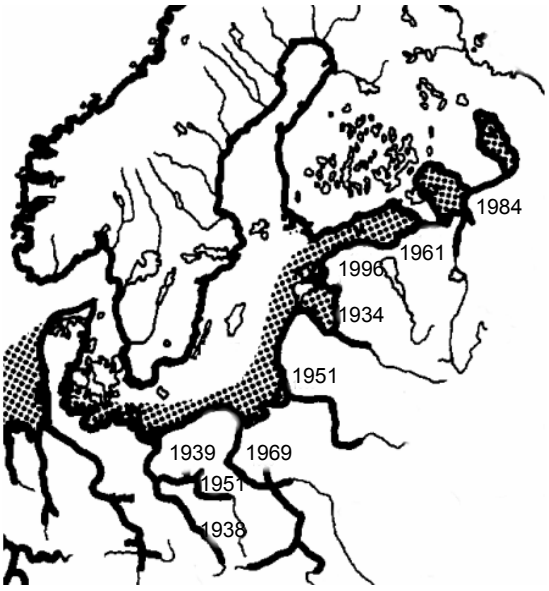
HELCOM Recommendation 17/2, adopted in 1996, gives priority to changing fishing practices in order to prevent accidental bycatch of harbour porpoises. Also further research on factors affecting the distribution and abundance of harbour porpoise is recommended. The protection of harbour porpoises in EU waters is now improved by the decision of the EU Council of Ministers on stepwise reduction in the use of driftnets from 1 January 2005 until complete prohibition by 1 January 2008, the compulsory use of acoustic deterrent devices ("pingers") on fishing nets, and the monitoring of by-catches through an observer scheme.

Plans to further study the genetic composition of the harbour porpoise populations together with ASCOBANS (Agreement on the Conservation of Small Cetaceans of the Baltic and North Sea) have been made by HELCOM.

Number of rivers with populations of Baltic sturgeon

Common sturgeon (*Acipenser sturio*) is the only species known to become extinct in the Baltic Sea in recent history.

Germany is leading the reintroduction of sturgeon into the Baltic Sea. Currently one joint reintroduction project between Poland and Germany is running in the Odra river system.



Historic distribution of sturgeon in the Baltic Sea; the shaded area represents the zone of main distribution, the spawning rivers (e.g., Odra, Vistula, Nemunas Daugava) and the uppermost point of migration is indicated by the solid lines; the most recent records are indicated by the annotated year

(Source: HELCOM 2002: Fourth Periodic Assessment of the State of the Marine Environment of the Baltic Sea Area, 1994-1998; Back-ground Document (BSEP 82b) p. 167; map after Holcik 1989.)

Spawning stock biomass of eastern Baltic cod and autumn-spawning herring compared to the precautionary level (Bpa) as advised by ICES and/or defined EC management plans

Fishing mortality level of eastern Baltic cod and autumn-spawning herring compared to the precautionary level (Fpa) as advised by ICES and/or defined EC management plans

Fish is an important component of the Baltic ecosystem and fish stocks need to be harvested sustainably in order to obtain a Baltic Sea in good environmental status.

For member countries of the EC, the fishing sector is the responsibility of the Community, placing fisheries policy outside the jurisdiction of individual nation states. As eight out of nine of HELCOM Contracting Parties are members of the EC, any aims to safeguard viable fish stocks in the Baltic must address the EC. Negotiations between Russia and EC on the Baltic Sea fisheries quotas are conducted within the framework of a new bilateral fisheries agreement expected to enter into force in the course of 2007.

The reformed EC Common Fisheries Policy of 2002 enabled a long-term approach to fisheries management, in contrast to the total allowable catches (TACs) set year-by-year. Such plans include the establishment of multi-annual recovery plans for stocks outside safe biological limits and of multi-annual management plans for other stocks. Areas and periods closed for fisheries are an important part of the European Commission's strategy for ensuring sustainable fisheries in the Baltic. Such measures not only reduce fishing effort, but also facilitate control and help prevent undeclared landings. The EC CFP should in general ensure the implementation of the Ecosystem Approach to Fisheries.

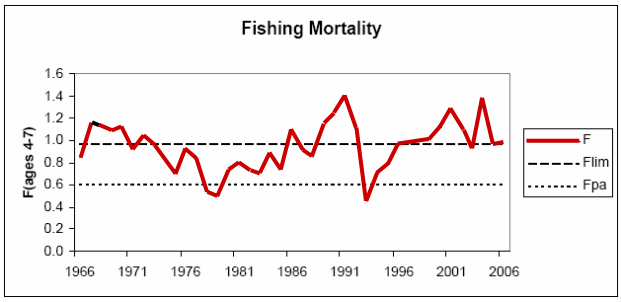
Cod –eastern stock

In the Baltic, hydrographic-climatic variability and heavy fishing during the past 10–15 years have led to a weakening cod recruitment, to generated favourable recruitment conditions for sprat and thus increased sprat predation on early life stages of cod (ICES 2006 and references therein).

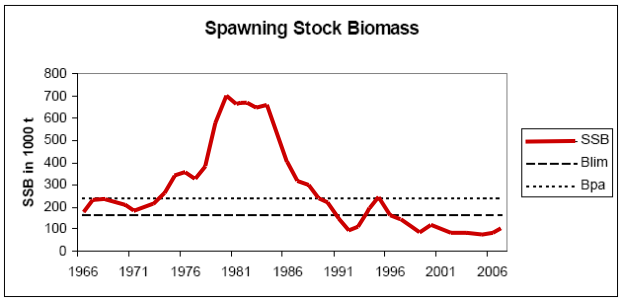
The eastern stock of cod is at a historical low level and no increase in the spawning-stock biomass could be observed in recent years. Based on the most recent estimates of SSB and fishing mortality ICES (2007) classifies the stock as suffering reduced reproductive capacity and being harvested unsustainably. Recent years have generally shown low recruitment; however, there are indications that the 2003 year class is above the average of the last 15 years.

ICES has advised low catches or a closure of the fishery and the implementation of a management plan for several years. The TAC has been set well above the recommended catches and was even increased for 2006.

ICES (2007) advices that in 2007 for eastern Baltic cod, fishery should be closed



Fishing mortality of eastern Baltic cod (adapted from ICES 2007).



Spawning stock biomass (SSB) of cod in the Baltic Sea, excluding the Sounds and the Kattegat (adapted from ICES 2007).

In order to recover the heavily depleted Baltic cod stocks a multi-annual plan for the cod stocks in the Baltic Sea was accepted in the Council minister meeting in 12 June 2007 In the plan it is set targets of fishing mortality rates of 0.6 for Western Baltic cod and 0.3 for Eastern Baltic cod. These mortality rates are to be reached with yearly 10% reductions until these target levels are reached.

Herring

Based on the most recent estimates of fishing mortality, ICES (2007) classifies the stocks to be harvested sustainably.

Trend of salmon smolt production in wild salmon rivers

The populations of Atlantic salmon (*Salmo salar*) in the Baltic Sea are genetically unique, both within the Baltic and especially compared to Atlantic populations. Wild salmon populations spawned in at least 60 rivers in the middle of the 19th century, but today the majority of Baltic rivers are unsuitable for salmon due to damming, mainly for hydroelectric power production as well as pollution. Also the M74 -syndrome, a reproduction disorder found in the sea-run Baltic salmon, has caused major reductions in smolt production in the northern parts of the Baltic, especially in the 1990s. Salmon fry are raised in artificial hatcheries and then released to compensate for the loss of their natural spawning areas. However, large-scale restocking practices cause a risk of genetic homogenisation of the Baltic salmon populations (ICES 2006).

According to ICES (2007), the total wild smolt production in the Baltic Sea proper and in the Gulf of Bothnia has increased about fourfold in assessment units 1-3 since the Salmon Action Plan was adopted in 1997. Wild smolt production is now estimated to be around two thirds of the potential total smolt production. The increase in smolt production is not uniform among rivers and is particularly low in the potential rivers, i.e. rivers where salmon were extirpated and are now being reintroduced

To evaluate the current state of the stock, ICES uses the smolt production relative to the level of natural production capacity on a river-by-river basis. This objective is likely to be met for several large rivers in the northern Baltic Sea area.

However, in the Gulf of Finland, the condition of the wild stocks is poor. Although the estimates of smolt production and the potential production capacity of the three wild salmon rivers are uncertain the status of these populations is considered to be unsafe.

Drafting of a similar multi-annual plan for Baltic salmon stocks as for Baltic cod has been planned as salmon stocks are diminishing despite increasing smolt production.

ICES (2007) advices that substantial reduction of salmon catches and fishing effort in directed salmon fishery is necessary compared to present levels. There should be no catch of wild salmon in the Gulf of Finland. Fisheries should only be permitted at sites where there is virtually no chance of taking wild salmon. To improve selectivity of harvesting, coastal fisheries at sites likely to be on migration paths of wild salmon from Estonian rivers should be prohibited. Poaching occurs in these rivers and must be stopped. Fishing in rivers and river mouths supporting wild stocks should be prevented.

Number of salmon rivers with viable stocks

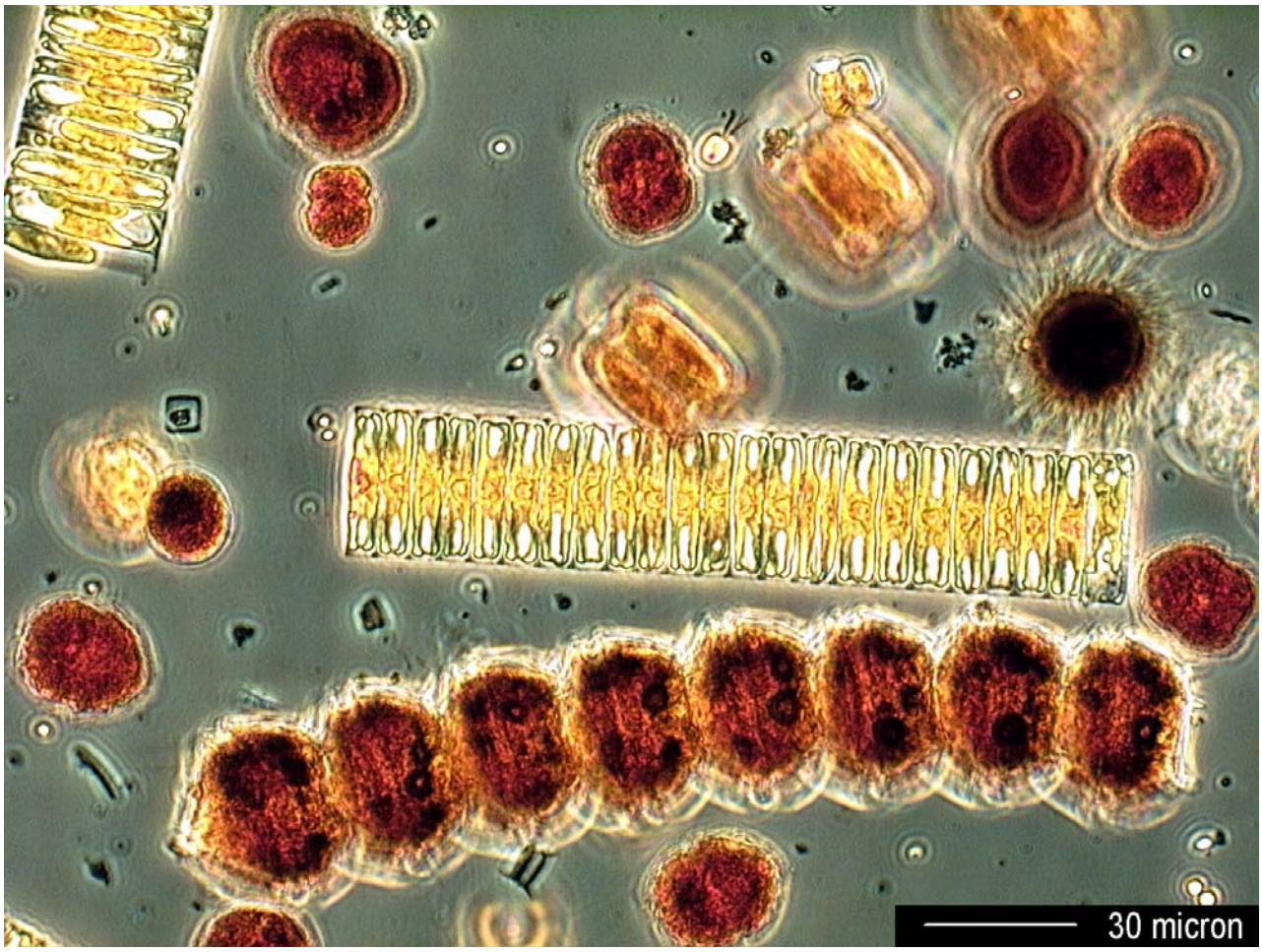
Currently 37 of 69 potential salmon rivers have wild smolt production.

Numbers of discards and bycatch of fish, seals and waterbirds and number of entangled and drowned marine mammals and water birds

The total bycatch of fish in the Baltic fisheries is presently unknown but the major fisheries for cod, herring, and sprat seem to have low bycatches (ICES 2000). The less important smaller fisheries can have a high proportion of bycatch (HELCOM 2002). It is currently impossible to come up with quantitative accounts of the bycatch of cod in sprat and herring fishery. These fisheries use small-meshed trawls in cod spawning areas (ICES advice to IBSFC request on closed areas 2004b).

In addition to the bycatches of harbour porpoises discussed earlier, according to ICES (2006), fishing nets, in particular set nets, have caused considerable mortality for long-tailed ducks (*Clangula hyemalis*), velvet scoters (*Melanitta fusca*), eiders (*Somateria mollissima*), and black scoters (*Melanitta nigra*). There are also reports of guillemot and razorbill (*Alca torda*) mortality in the driftnet fishery for salmon (HELCOM 2003).

Seals have been recorded caught in fyke nets, set nets, and salmon driftnets, but although the recorded data almost certainly underestimate the total number of by-caught seals, the added mortality does not appear to restrain the seal populations from increasing (Helander and Härkönen, 1997).



Spring bloom phytoplankton. Seija Hällfors, FIMR

Annex 1

The 61 species listed in the HELCOM list of threatened and/or declining species and habitats/biotopes of the Baltic Sea area (2006), number of BSPAs protecting the species and Contracting States that have reported the species to be protected within the current BSPA network. Information on threat and decline is based on the HELCOM list (2006) and information on Contracting States and the number of BSPAs is based on information in the BSPA Database.

Species	Sub-region where under threat and/or decline	Contracting State reported species	No of BSPAs where reported	Remarks
A=Bothnian Bay, B=The Quark, C=The Bothnian Sea, D=Åland Sea, E=Archipelago Sea, F=Gulf of Finland, G=Gulf of Riga, H=The Northern Baltic Proper, I=Western Gotland Basin, J=Eastern Gotland Sea, K=The Southern Baltic Proper, L=The Gulf of Gdansk, M=Bay of Mecklenburg, N=Kiel Bay, O=Little Belt, P=Great Belt, Q=The Sound, R=Kattegat				
ALGAE				
Fucus vesiculosus	F*,L,N	SE	3	*Not in FI waters
Chara horrida	D,E,F,H, I, K, M	SE	1	
Chara tomentosa	F*		0	*Not in FI waters
Chara braunii	A,B,C,F		0	
Chara connivens	D,H		0	
Lamprothamnium papulosum	O,P,R		0	
Fucus serratus	M,N		0	
Furcellaria lumbricalis	L,M,N,J		0	
VASCULAR PLANTS				
Hippuris tetraphylla	A,B,C*,D,E,F	FI	5	*Status not clear in SE
Alisma wahlenbergii	A,B,C,F	FI	4	
Zostera marina	L,M,N,O,P,Q,R		0	
Zostera noltii	M,N,R		0	
INVERTEBRATES				
Cerastobyssum hauniense	L,M,Q		0	
Mya truncata	M,Q,R		0	
Monoporeia affinis	F*,G,H,K		0	* Due to oxygen depletion
Pontoporeia femorata	M,F*,G,H		0	* Due to oxygen depletion
Saduria entomon	K		0	
Macroplea pubipennis	A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R		0	
Macroplea mutica	A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R		0	Not threatened in Finland
FISH				
Lampetra fluviatilis	K,L,M,N,O,P,Q,R	EE,FI,LV,PL	9	
Salmo salar	A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R	EE,LV,PL	5	

Species	Sub-region where under threat and/or decline	Contracting State reported species	No of BSPAs where reported	Remarks
A=Bothnian Bay, B=The Quark, C=The Bothnian Sea, D=Åland Sea, E=Archipelago Sea, F=Gulf of Finland, G=Gulf of Riga, H=The Northern Baltic Proper, I=Western Gotland Basin, J=Eastern Gotland Sea, K=The Southern Baltic Proper, L=The Gulf of Gdansk, M=Bay of Mecklenburg, N=Kiel Bay, O=Little Belt, P=Great Belt, Q=The Sound, R=Kattegat				
Coregonus spp.	A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R	EE,FI	5	
Cottus gobio	F,G,H,I,J,K,L,M	EE,FI,LV	5	Not in FI and SE waters
Clupea harengus subsp.	J,K,L,M,N,O,P	DK,LV,PL,SE	4	
Cobitis taenia	C*,D*,F,G,H,I,J,K,L,M,N,O,P,Q,R	EE,LV,PL	4	*Not in FI waters
Petromyzon marinus	A*,B*,C*,D*,E*,F*,G,H,J,K,L,M,N,O,P,Q,R	DK,PL	3	*Occurs temporally in FI
Alosa fallax	A*,B*,C*,D*,E*,F*,G,H,J,K,L,M,N,O,P,Q,R	EE,PL	3	*Occurs temporally in FI
Alosa alosa	I,J,K,L,M,N,O,P,Q,R	PL	2	
Lamna nasus	A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R		0	
Scyliorhinus canicula	R		0	
Squalus acanthias	A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R		0	
Amblyraja radiata	A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R		0	
Dipturus batis	A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R		0	
Raja montagui	R		0	
Acipenser oxyrinchus	Very likely almost extinct		0	
Acipenser sturio	Extinct		0	
Anguilla anguilla	A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R		0	
Syngnathus acus	R		0	
Gadus morhua	A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R		0	
Pollachius pollachius	A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R		0	
Lumpenus lampretaeformis	F*,G,H,I,J,K,L,M,N,O,P,Q		0	* FI:lack of data, in SE data incomplete/old
Sebastes viviparus	R		0	
BIRDS				
Sterna caspia (breeding)	A,B,C,D,E,F,G,H,I,K	EE,FI,PL,SE	28	
Melanitta fusca (breeding)	E	DK,FI,SE	23	
Sterna albifrons	A,E,G,I,J,K,L,M,N	DK,EE,FI,LV,PL,SE	22	
Podiceps auritus (wintering)	K,L	EE,FI,LV,PL,SE	18	
Gavia stellata (wintering)	K,L	EE,FI,LV,PL,SE	15	
Larus fuscus fuscus (breeding)	A,B,C,D,E,F,G,H,I	DK,FI	15	
Sterna sandvicensis	K,L,M,N	DK,PL,SE	14	
Cepphus grylle (breeding/wintering)	Breeding: B*,C*,D*,E* Wintering: K	DK,FI,SE	15	*Not in FI waters
Gavia arctica (wintering)	K,L	FI,SE	12	

Species	Sub-region where under threat and/or decline	Contracting State reported species	No of BSPAs where reported	Remarks
A=Bothnian Bay, B=The Quark, C=The Bothnian Sea, D=Åland Sea, E=Archipelago Sea, F=Gulf of Finland, G=Gulf of Riga, H=The Northern Baltic Proper, I=Western Gotland Basin, J=Eastern Gotland Sea, K=The Southern Baltic Proper, L=The Gulf of Gdansk, M=Bay of Mecklenburg, N=Kiel Bay, O=Little Belt, P=Great Belt, Q=The Sound, R=Kattegat				
Tadorna tadorna (breeding)	K,L,M	FI	10	
Mergus serrator (breeding)	G,M	DK,FI,SE	9	
Calidris alpina schinzii (breeding)	A,B,C,D,E,F,K,L,M,N	EE,FI,PL	6	
Polysticta stelleri (wintering)	K	FI	5	
MAMMALS				
Halichoerus grypus balticus	J,K,L,M	DK,EE,FI,PL,SE	23	
Phoca hispidia botnica	A*,B*,C*,D*,E*,F*,G*,H*	EE,FI,SE	9	*Not in Finnish waters
Phoca vitulina vitulina	K,L,M,N,O,P	DK,SE	6	
Phocoena phocoena	C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R	PL,SE	5	

Annex 2

Initial list of threatened and/or declining habitats/biotopes of the Baltic Sea Area (HELCOM 2006).

* denotes regional occurrence, heavily endangered, endangered potentially endangered.

Name	Bothnian Bay	The Quark	The Bothnian Sea	Åland Sea	Archipelago Sea	Gulf of Finland	Gulf of Riga	The Northern Baltic Proper	Western Gotland Basin	Eastern Gotland Sea	The Southern Baltic Proper	The Gulf of Gdansk	Bay of Mecklenburg	Kiel Bay	Little Belt	Great Belt	The Sound	Kattegat	Remarks
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	
Offshore (deep) waters below the halocline			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Shell gravel bottoms											*	*	*	*	*	*	*	*	
Seagrass beds			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	Not "heavily endangered" in Finnish waters
Macrophyte meadows and beds	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Gravel bottoms with Ophelia species													*	*	*	*	*	*	
Sandbanks which are slightly covered by sea water all the time	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Estuaries	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Mudflats and sandflats not covered by seawater at low tide	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	Not in Finnish waters
Coastal lagoons	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Large shallow inlets and bays	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
Reefs	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	Not in Finnish waters
Submarine structures made by leaking gases (Bubbling Reefs)																		*	
Baltic esker islands with sandy, rocky and shingle beach vegetation and sublittoral vegetation	*	*	*	*	*	*		*			*				*	*	*	*	Not in Finnish waters/territory
Boreal Baltic narrow inlets (Fjords)	*	*	*	*	*	*		*	*		*								Not in Finnish waters
Maerl beds																		*	
Sea pens and burrowing megafauna communities																		*	

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Cover picture: *Montage by Juha-Markku Leppänen using original photographs of Seija Hällfors and Riku Lumiaro, FIMR.*

Flounder smileys: *Based on ink drawings by Hermanni Backer*

The production of this document has been partly funded by the European Community

(Actions 07.0201/2006/444167/SUB/D2 and 07.0201/2005/414002/SUB/D2)