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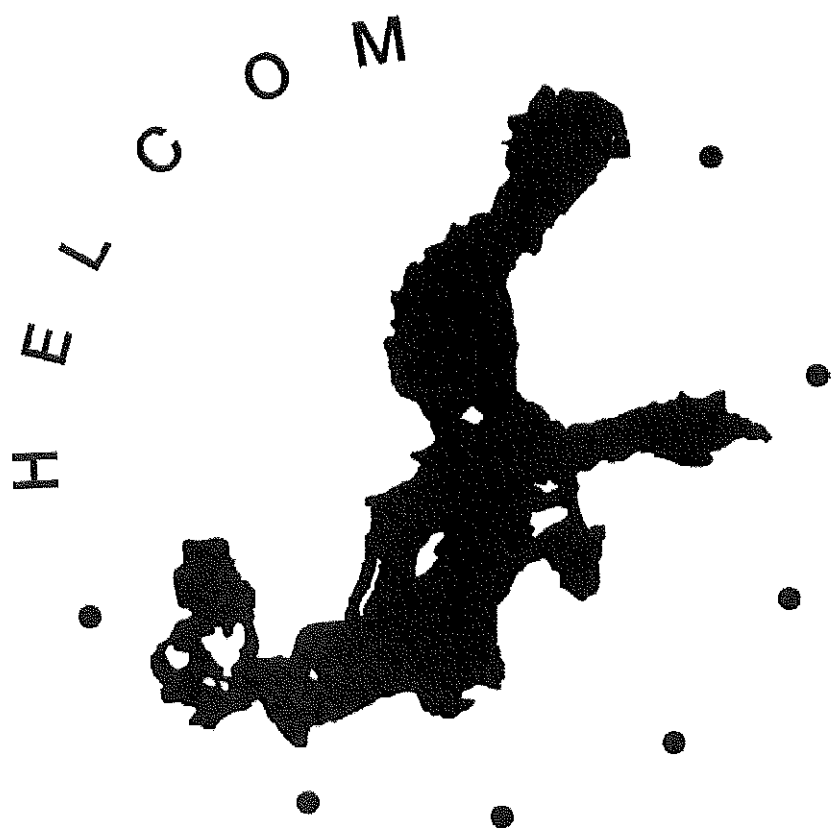

HELCOM Stakeholder Conference on the Baltic Sea Action Plan
Helsinki, Finland, 7 March 2006

HELCOM ECOLOGICAL OBJECTIVES FOR AN ECOSYSTEM APPROACH

Introduction

The Regional Seas Conventions work for the protection of marine and coastal environments in 18 regions of the world. In the Baltic Sea area the Helsinki Commission (HELCOM) co-ordinates implementation of the Helsinki Convention. The convention has the aim to prevent and eliminate pollution in order to promote the ecological restoration of the Baltic Sea area and the preservation of its ecological balance (HELCOM 1992).

The HELCOM and the joint HELCOM/OSPAR Ministerial Declarations of 2003 put explicitly a new management concept, the ecosystem approach to the management of human activities (Ecosystem Approach), at the centre of HELCOM work (HELCOM 2003; HELCOM & OSPAR 2003). The joint declaration commits the parties to apply and further develop the measures necessary to implement an ecosystem approach by 2010.

In the Ecosystem Approach the state of the ecosystem itself is used as a measure by which to identify, plan and implement management actions needed to combat pollution from all sources and to promote protection, as well as sustainable use and development, of the environment. This differs from earlier sector-by-sector approach.

In Ecosystem Approach the present, or projected, state of the whole ecosystem is defined by comparing measured, or forecasted, level of selected indicators to target levels representing good, but not necessarily pristine, state. Progress in defining the overall state, or -using more popular wording- *health*, of the ecosystem eventually determines the success of this approach.

The HELCOM 2003 Bremen declaration invites HELCOM to develop and apply objectives and appropriate indicators of the eutrophication status which express "good quality status" as stipulated in the EU Water Framework Directive (WFD) (Anon. 2000), but covering the whole Baltic Sea Area (HELCOM 2003).

The declaration states further that this approach should be harmonised with other similar international activities, such as the WFD adopted for the inland and coastal waters of the EU Member States, and the proposed European Marine Strategy (EMS)(Anon. 2005).

The aim of this document is to describe the emerging HELCOM Baltic Sea assessment system based on Ecological Objectives presently merged into the HELCOM Baltic Sea Action Plan. The results are an example of a way to begin implementing Ecosystem Approach, and defining ecosystem health, in a regional sea. The relation of this drafted HELCOM assessment system to similar concepts in other international initiatives such as Convention of Biological Diversity (CBD, (1992), European legislation (WFD as well as the emerging EMS) will be discussed.

Foundations of an ecosystem assessment system

HELCOM adopted a stepwise approach in developing a system consisting of a vision, strategic goals, regional objectives and indicators with target levels. The main aim has been to lay the foundations of a hierarchical assessment system where higher levels can be seen as indices integrating the underlying scientific measurements (Figure 1).

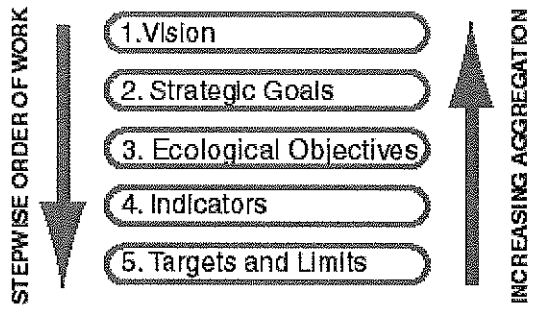

***Figure 1**. Stepwise approach to define good ecological status.*

The last two steps (4 and 5 in Figure 1) needed in order to unambiguously define good ecological status, quantitative indicators and targets, are not within the scope of this article. This substantial work will be completed by experts in each specific field. For eutrophication this work is already past its pilot phase (HELCOM *in press*).

In the adopted system the *Vision* describes overall ambition, *Strategic Goals* define major topic areas (e.g. eutrophication), *Ecological Objectives* describe central characteristics of a healthy sea (e.g. clear water) in a simplified way, *indicators* on the other hand exactly define a quality assured method to measure and present the ecological state (e.g. summertime Secchi depth). Finally the *targets* define the indicator value representing acceptable deviation from historical background levels (reference levels) for the given indicator and given geographical area.

A common vision was drafted in order to integrate the aims of HELCOM with several national, international as well as European conventions and policies. The 2004 Meeting of the Helsinki Commission adopted the overall vision: *Healthy Baltic Sea environment, with diverse biological components functioning in balance, resulting in a good ecological status and supporting a wide range of sustainable human economic and social activities* (HELCOM 2005).

This vision names bio*diversity* in the spirit of CBD as well as *good ecological status* in the spirit of the WFD as essential components of the healthy Baltic Sea. The aim to reach *ecological balance* in the Baltic environment is included in the 1992 Helsinki Convention text and echoes the consensus reached at the United Nations Conference on Environment and Development (UNCED 1992). The vision statement emphasises also one of the ultimate reasons for HELCOM efforts to protect the Baltic Sea environment: its socioeconomic value interpreted in the widest possible sense (including social values).

The Baltic Sea ecosystem has been recognised by HELCOM as being threatened by four major human activities: 1) eutrophication caused by excessive inputs of nutrients, 2) health problems caused by inputs of hazardous substances, 3) pollution by maritime activities, and 4) loss of biodiversity caused by the aforementioned issues as well as direct extraction of biomass mainly in the form of fishing (HELCOM 2003). The Vision forms a conceptual basis in which the defined concerns can be related to "*diverse biological components functioning in balance*" i.e. biodiversity as depicted in Figure 2.

Four strategic goals were adopted to reflect these four main themes of concern under the management mandate of HELCOM (Figure 3). The strategic goals aim at the Baltic Sea unaffected by eutrophication, its life undisturbed by hazardous substances and maritime activities carried out in an environmentally friendly way, all making possible the favourable status of the Baltic Sea biodiversity.

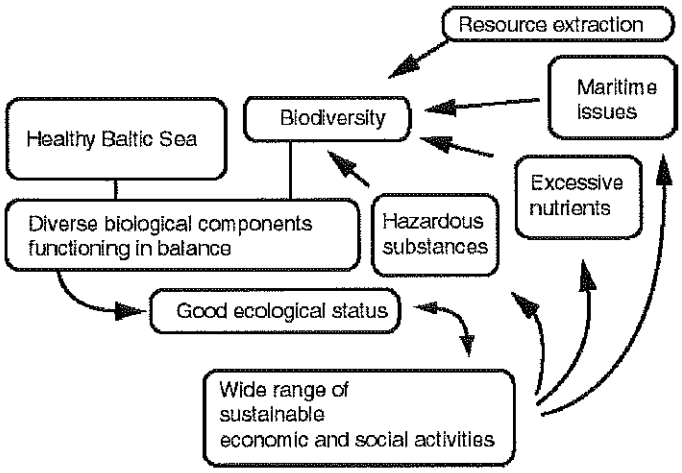

Figure 2. *Schematic picture of the interlinkage between the vision and the main anthropogenic pressures on the Baltic ecosystem under management by HELCOM.*

In addition to the three ecological goals, HELCOM aims to ensure that all maritime activities are carried out in an environmentally friendly way (Figure 3). Specific human activities, such as maritime activities including shipping, affect often the Baltic ecosystem in multiple ways. For shipping this includes non-indigenous species introductions, exhaust nitrogen emissions and risks of accidents and oil spills.

Fish stocks are an integral part of Baltic fauna and will in this system be assessed under the strategic goal for biodiversity. Fisheries as such have traditionally been managed by others than environmental protection organisations; commercial fisheries management (e.g. setting quotas) is for this historical reason not explicitly part of HELCOM mandate. However, fish stocks of commercial and recreational interest, as well as environmental effects of fisheries, have been traditionally and naturally included in the HELCOM periodic assessments.

Selecting objectives

A common set of ecological objectives, defining further the hierarchical system described in Figure 1 will be used to communicate central ecosystem characteristics to a wider community. Therefore it is important to include topics of common interest in an assessment system. The aim is to make assessments more concrete and interesting for environmental managers and general public without reducing their scientific value. Topics such as toxicity of food, sizes and stocks of recreationally valuable fish, clarity of water, well-being of species like seals and eagles are concrete and widely interesting. If not presented in a proper way such parameters as nutrient concentrations, or abundances of microscopic species, are usually less interesting for the public even if ecologically important.

The objectives presented in Figure 3 are a result of a combined consensus achieved with large number of experts representing science and management. As many of the processes operating in the marine environment are not well documented, with eutrophication as an exception, the selection is to some degree subjective.

Biodiversity

The strategic goal for protection of nature and biodiversity is the "favourable conservation status of the Baltic Sea biodiversity". The Ecological Objectives related to this goal are divided into landscape/seascape level, community level and species level, reflecting the CBD, focused on levels "within species", "between species" and "of ecosystems" (Figure 3).

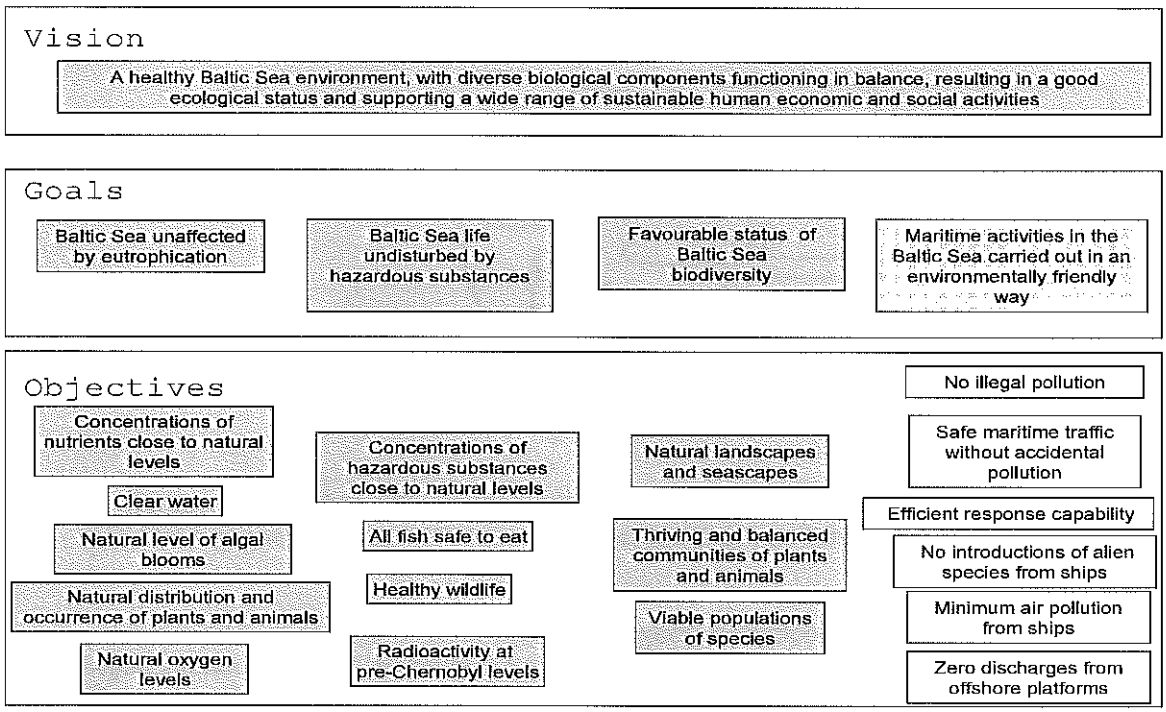

***Figure 3**. General outline of the HELCOM assessment system. For each Objective a number of indicators with target levels have to be agreed upon. In order to have objectives for all HELCOM main issues of concern the project has also developed management objectives for maritime activities. As maritime issues are a pressure acting on, and not an ecological state of, the marine environment the maritime objectives are coloured white.*

All Objectives under the other three Goals, pertaining to eutrophication, hazardous substances and maritime activities, are also relevant to biodiversity as described in Figure 2.

Biodiversity or biota in general, in the Baltic Sea is affected by a number of human pressures including nutrient inputs, hazardous substances inputs, alien species inputs as well as resource extraction (Figure 4).

The objective **natural landscapes and seascapes** underlines the importance of diverse coastal and marine landscapes, associated ecosystems, processes and cultural values. The Baltic Sea Protected Area (BSPA) network is set up in a way to comprehensively cover different ecosystems and landscapes. Thus the implementation status and the ecological coherence of the network can be used as tools to assess the level of protection afforded to