

BALANCE

Application of the Blue Corridors concept for the Baltic Sea area

BALANCE Conference

25-26 October 2007

Copenhagen, Denmark

Denmark
Estonia
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Baltic Sea

Definitions

Connectivity on habitat and landscape scales

Dispersion of Baltic Sea species, diversity of life
strategies

Genetic aspects of connectivity

Practical guide on application of BC concept

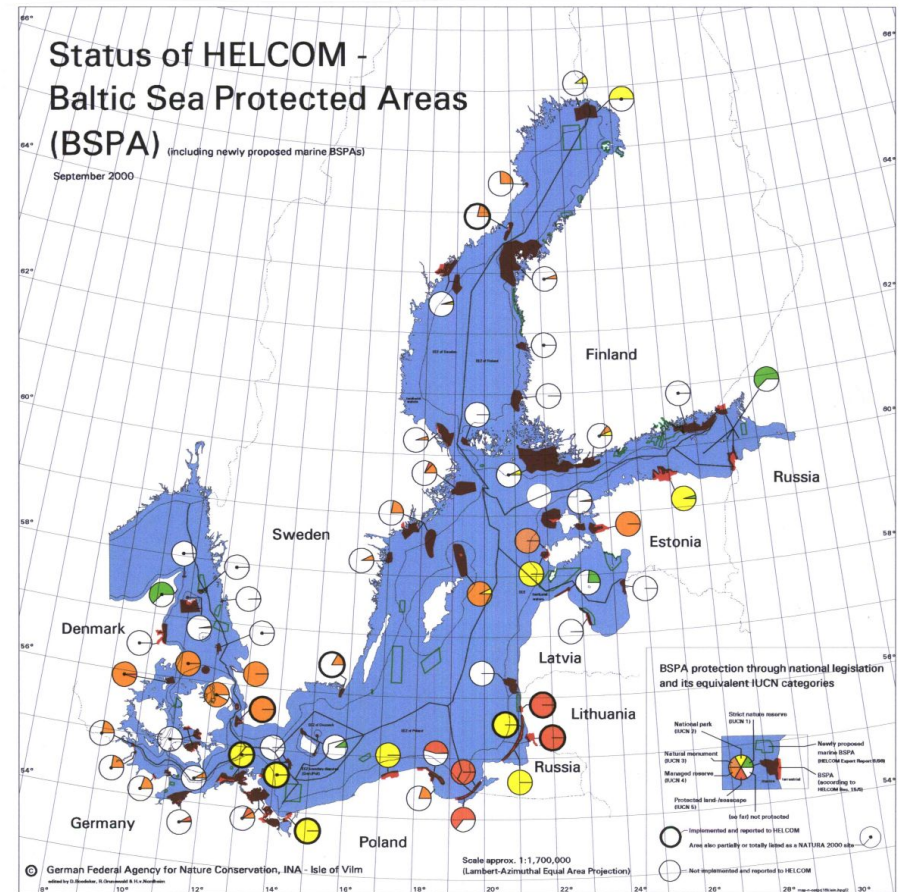
Conclusions

Introduction

Connectivity between marine areas, habitats, populations, species or MPAs

It terrestrial environment good evidence exist that corridors can direct dispersal and influence range of distribution for variety of organism groups.

In marine environment much less direct evidence exist demonstrating the utility of protected corridors for conservation



BALANCE work on Blue corridors concept

WP deliverables:

1. Literature review (68 p)
269 literature sources
2. A practical guide on application of blue corridor concept on MPAs for biodiversity conservation in the Baltic Sea



Biological and Ecological features of the Baltic Sea – distribution pattern of habitats and species

Baltic Sea is characterised by:

Geomorphological diversity

Variety of environmental gradients

Mixture of hydrologically isolated and open basins

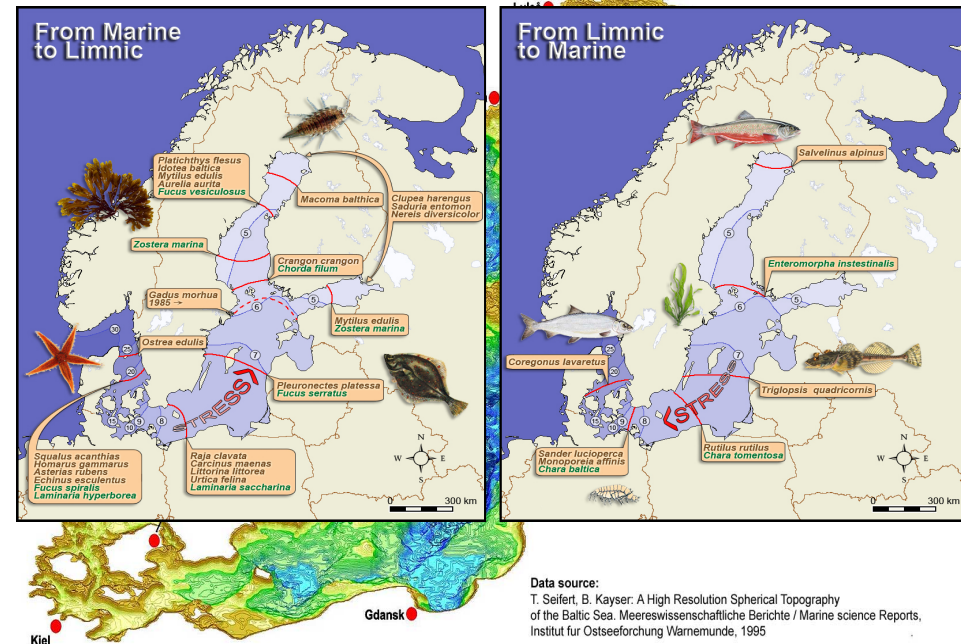
Prevailance of physical forcing over biological regulation

Geologically short period of evolution of the water body

Resulting in:

Low species diversity

High level of habitat fragmentation and uniqueness



Environmental conditions structuring the animal and plant communities in the Baltic Sea

Regional scale:

Salinity

Hydrological features

Local scale:

Substrate quality

Exposure

Light availability

Ice scraping/shading

Human influence (Eutrophication, Fisheries, artificial substrates)



West-Estonian Archipelago Sea

Blue corridors - definitions

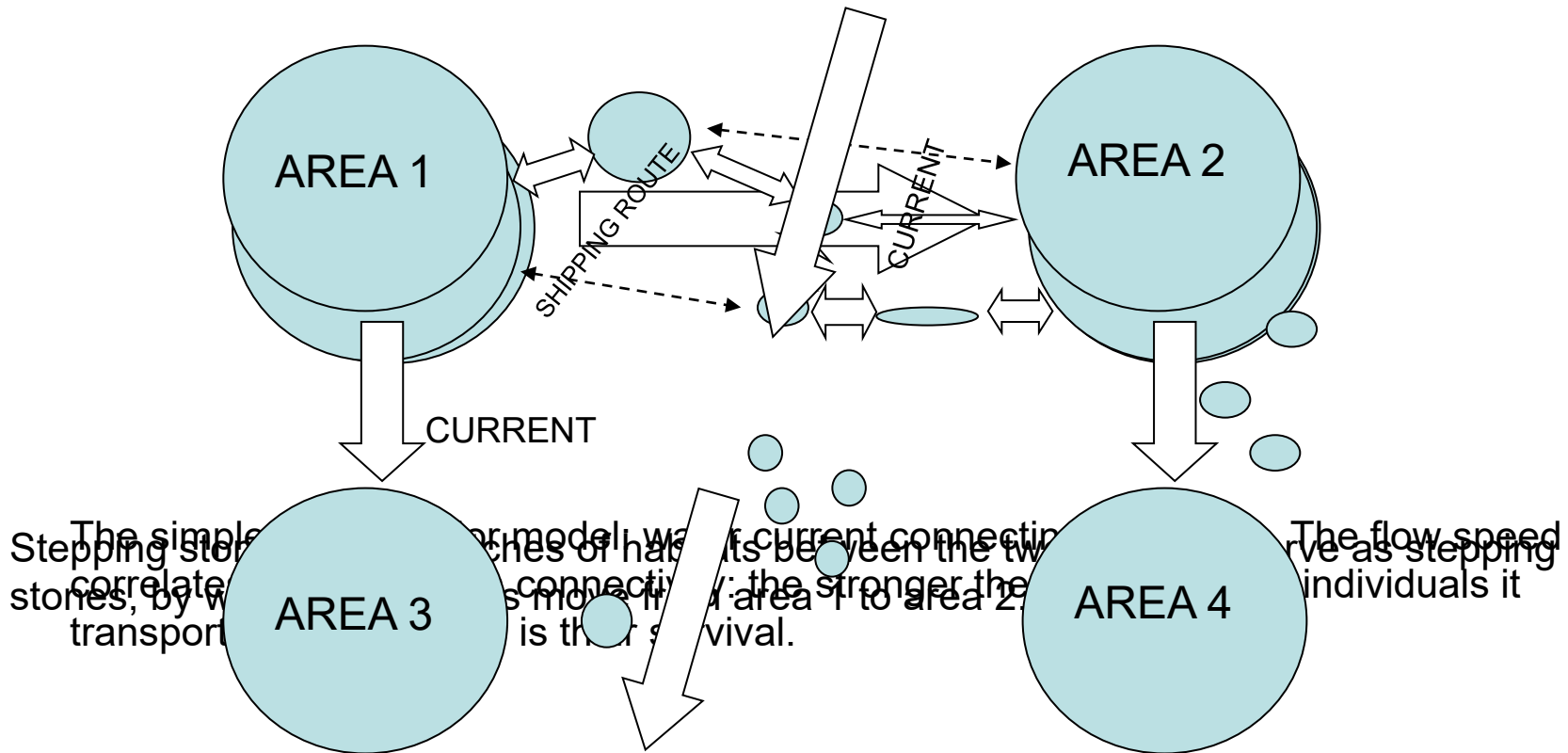
A blue corridor is:

a route of particular importance for the population exchange between locations and of importance for the maintenance of biogeographical patterns of species and communities.

Blue corridors are shaped by interaction between the biological characteristics of a species, the physical/chemical characteristics of an area, and the geographical location of habitats.

Blue corridors can therefore either be concrete physical features or the preferred or realised route of spread of a species.

Blue corridors - definitions



A schematic network of MPAs with currents, stepping stones and human disturbance.



Connectivity on habitat and landscape scales

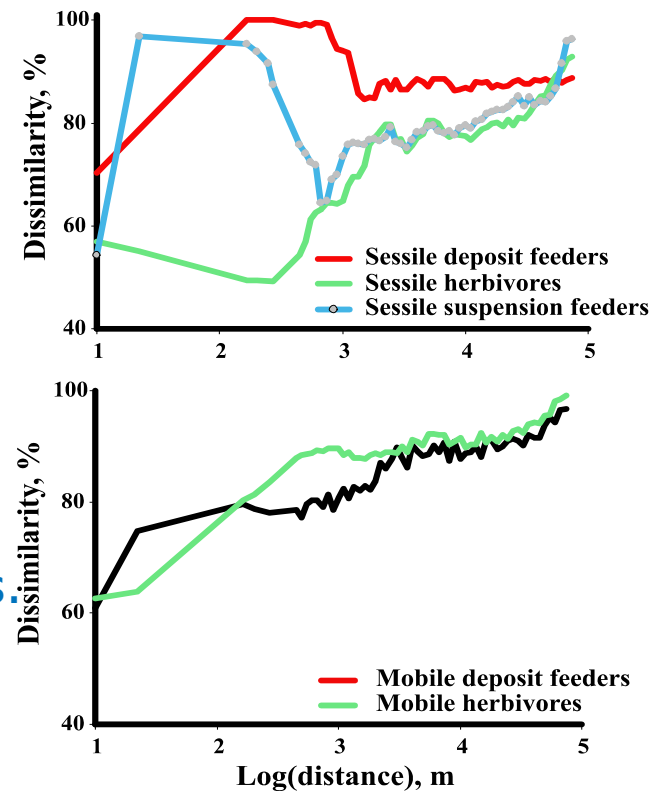
Causes of variability in structure of biological communities are scale dependant

Rare species are disproportionately affected by loss and fragmentation of habitat

The effect of size and proximity of a habitat to the diversity of neighbouring habitats is species specific.

Habitat fragmentation can favour establishment of non indigenous species.

Artificial structures increase fragmentation of natural habitats.



Average dissimilarity of invertebrate communities as a function of geographical distance between communities

Dispersion of Baltic Sea species – diversity of life strategies

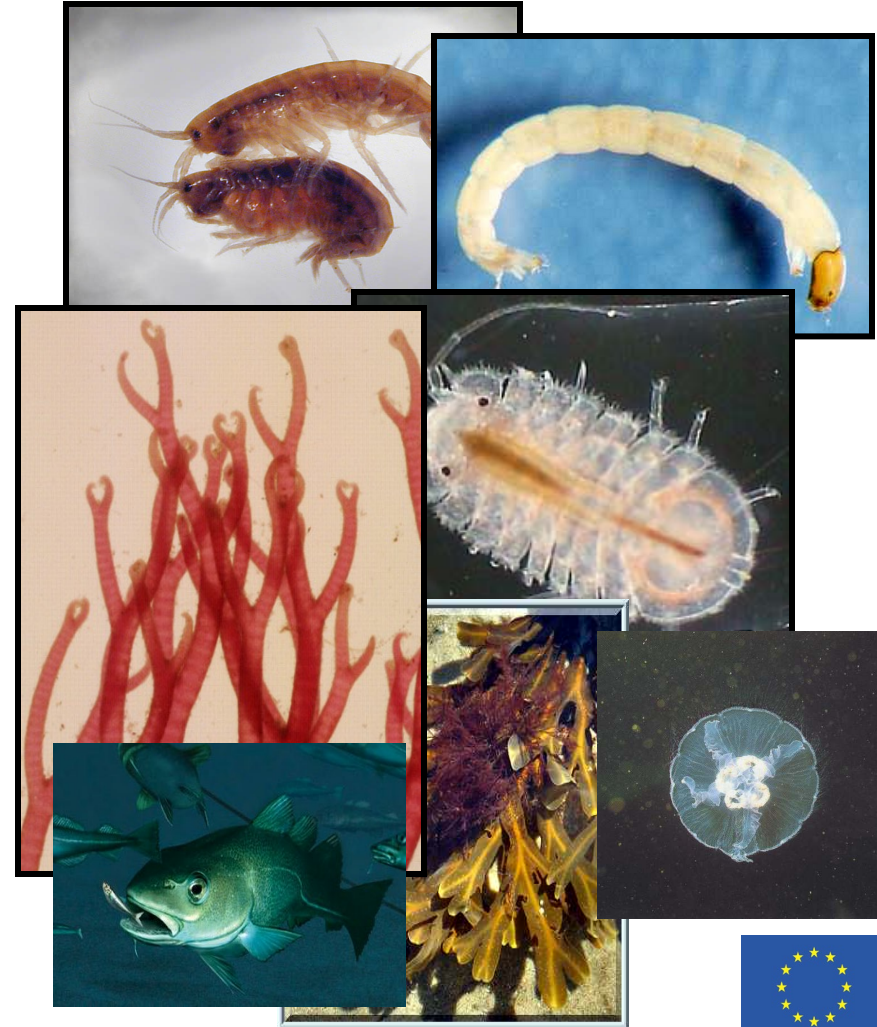
Fish species show large spatial dispersal at larval phase and, in case of migratory or pelagic species, at adult phase.

The completion of the pelagic stage of **invertebrate** larvae in the Baltic region varies typically in the time scale of weeks.

Scale of dispersion of major **macroalgal** species varies from 10m to several kms.

Drifting algal mats are a medium of dispersal for many invertebrate and algal species

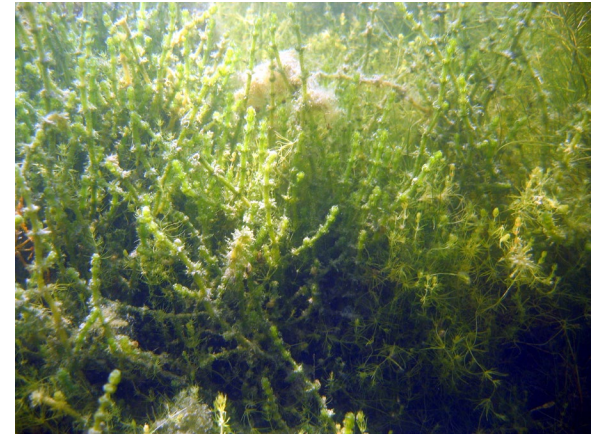
Short or medium distance dispersion patterns prevail in Baltic Sea communities.



Genetic aspects of connectivity in the conditions of Baltic Sea

Genetic considerations are important for the selection and management of protected areas from at least three perspectives

- a) Genetic information can contribute to the knowledge about what type of biological values are present in an MPA
- b) Genetic information can give data on the performance of an MPA
- c) Genetic information can aid in the design and management of an MPA, or a network of MPAs

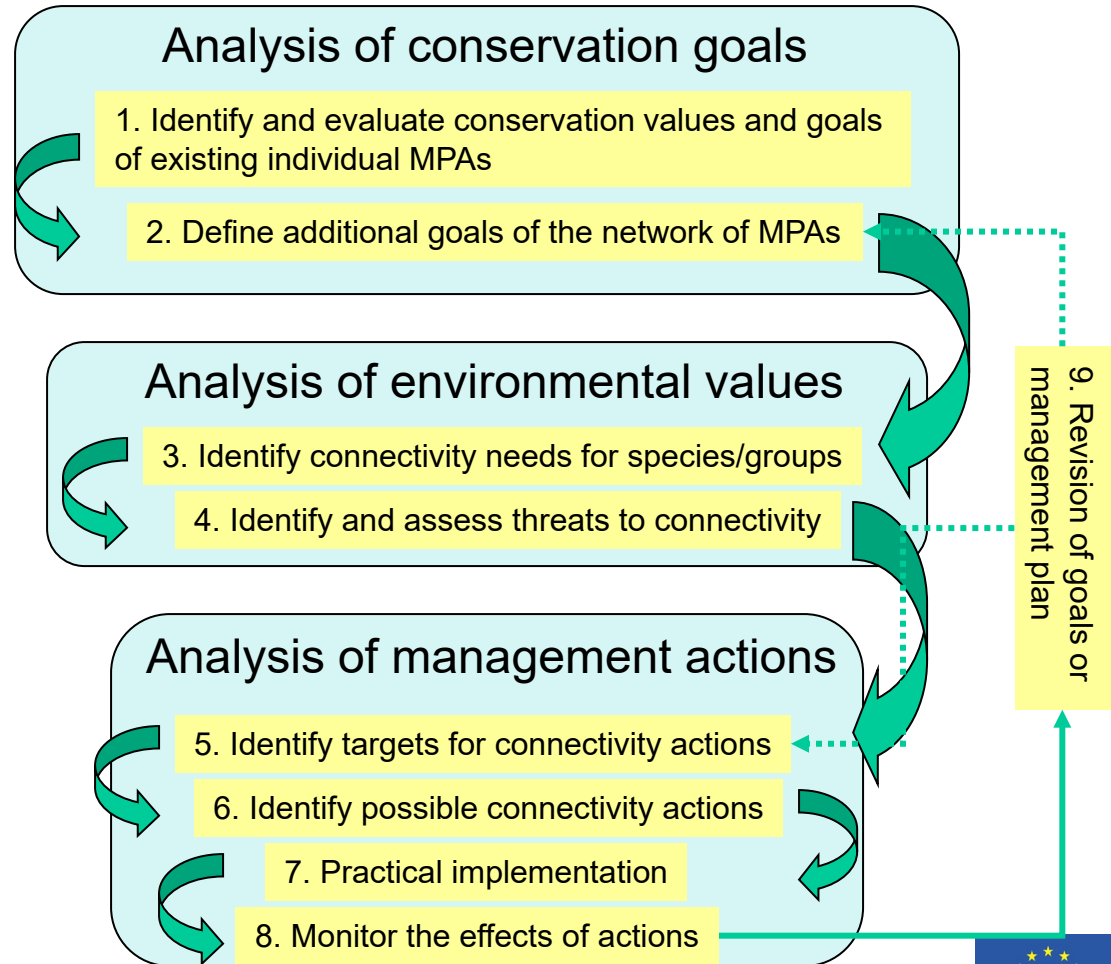


Practical guide on application of BC concept on MPA for biodiversity conservation in the Baltic Sea.

9 decision steps
organised in 3 separate
blocks

Explanation for each
step with relevant
examples

Definitions and short
theoretical background



Conclusions & perspectives

Key messages

Different processes operate at different spatial scales. Processes operating at small scales can influence large-scale patterns. In The Baltic Sea high connectivity is observed on local and medium scale and low on large scale.

There are both supporting and rejecting evidence for the blue corridors.

The conversion of continuous habitat to small isolated patches (i.e. habitat fragmentation) generally decreases the reproductive output, movement, survival, and population size of many species

Conservation strategies need to incorporate the protection of areas with heterogeneous habitats that are important to meet the changing habitat requirements of complex life cycles.

Acknowledgements

The results presented were funded by BALANCE

BALANCE is part-financed by
the European Union (European Regional Development Fund)
within the BSR INTERREG IIIB Programme

The following persons and institutions have contributed:

- ▶ Anita Mäkinen
- ▶ Åsa Andersson
- ▶ Grete E. Dinesen
- ▶ Jonne Kotta
- ▶ Jørgen Hansen
- ▶ Kristjan Herkül
- ▶ Kurt W. Ockelmann
- ▶ Per Nilsson
- ▶ Samuli Korpinen
- ▶ Lena Bergström
- ▶ Ulf Bergström
- ▶ Peter Blanner
- ▶ Karsten Dahl
- ▶ Ann-Britt Florin
- ▶ Jørgen L. S. Hansen
- ▶ Alf B. Josefson
- ▶ Madeleine Nyman
- ▶ Martin Schneekloth

Thank you for your attention !

