MINUTES of Meeting

26 September 2005

Project:	BALANCE
Subject:	Method for selection of representative networks of MPAs
Date:	15-16 September 2005
Place:	SEPA, Stockholm, Sweden
Participants:	See Annex 1
Distribution:	Participants + web site
Minutes by:	ASL+ ÅA

Agenda:

1. Introduction: aim of the workshop
2. Presentation of the BALANCE project
3. Presentation of BALANCE WP3
4. The Baltic Sea - characteristics
5. Marxan - an overview
6. Marxan - technical information
7. Developing a methodology for site selection in the Baltic Sea
   - ecological criteria and data requirements
9. Inclusion of socio-economic factors
10. Summary and advice from TNC

Minutes: *Action/deadline*

1   Katarina Veem, head of the Oceans and Coast Program at
WWF SWEDEN, who welcomed the participants and invited
experts to the workshop, opened the meeting.

All participants gave a brief presentation of themselves. A List
of Participants is enclosed as Annex 1.

Åsa Andersson presented the agenda and gave an introduc-
tion to the aim of the workshop:

- Learn more about MARXAN and The Nature Conservancy
  (TNC) methodology for selection of representative net-
  works of MPA

- Develop a <u>methodology</u> adjusted to the Baltic Sea
- Make a list of selection criteria (targets and goals)

2   Ole Vestergaard (DIFRES) introduced the BALANCE project, work package 1-4 and the links connecting them:

- WP1 data management
- WP2 marine landscapes and habitats
- WP3 Blue corridors and Natura 2000
- WP4 marine spatial planning

The PowerPoint presentation can be found at the BALANCE web site (http://www.balance-eu.org)

3   Åsa Andersson (WWF Sweden, WP3-leader), presented the objectives of work package 3, with focus on evaluation of representativity of landscapes and habitat and how the MARXAN software will be part of the process:

1. Development and demonstration of the "blue corridor" concept
2. Evaluation of representativity of landscapes & habitats in the Natura 2000 network and other MPA networks in the Baltic Sea.
   - Tools / methodology for evaluation and establishment of representative MPA networks
   - Evaluation of representativity of landscapes & habitats in the Natura 2000 network and other MPA networks in the Baltic Sea.
   - Gaps identified (landscapes, habitats & species not sufficiently covered)
   - Suggestions on how to improve representativity in existing MPA network
3. Evaluation of coherence between sites in the Natura 2000 network and other MPA networks in the Baltic Sea.

The PowerPoint presentation can be found at the BALANCE

web site (http://www.balance-eu.org). It was **underlined** that one of the main objectives of the workshop was to agree on a preliminary list of ecological criteria (targets and goals) for selection of a representative MPA network in the Baltic Sea.

4 Cecilia Lindblad (SEPA) made a short presentation with focus on the characteristics of the Baltic Sea:

- What makes the Baltic Sea so unique?
- The defined sub-regions of the Baltic Sea and its characteristics

The Baltic Sea PowerPoint presentation can be found at the BALANCE web site (http://www.blance-eu.org).

5 Annette Huggins (The Nature Conservacy) gave an introduction to TNC, their area of interest and the methodology for site selection using the MARXAN software. For more details on TNC and their work visit http://www.nature.org.

The method aims to be transparent, flexible, repeatable and driven by the aim quantifying the representation. MARXAN is a decision support tool, designed to give options for further discussion with experts, authorities and stakeholders.

MARXAN is a free software originally developed for use in the Great Barrier Reef. It is designed to implement already existing algorithms for optimization of site selection. The software is available via http://www.ecology.uq.edu.au/marxan.htm

The process from data management and GIS-analysis to MARXAN outputs was briefly presented. According to experience from previous projects the time consuming part, especially when handling data from so many different sources is to secure data compatibility. Another challenge is to set targets and goals for the network.
A brief outline of TNC/MARXAN terminology:

- Targets = specified targets for conservation in the network i.e. species and habitats
- Goals = proportion of each target to be included in the network
- Planning Unit (PU) = the units of the analysed area
- Portpolio = a set of planning units. MARXAN selects a number of planning units to meet the goals specified by the user, ie minimise cost/area.
- The cost = actual or modelled cost of a PU.
- The cost surface = can be used to steer MARXAN to/from areas.
- The cost of a portfolio = a weighted sum of PU costs
- The objective function = a function calculating the total cost of a portfolio.
- Simulated annealing = an optimizing algorithm based on iterative improvement. Preferred algorithm due to it ability to accept bad moves and therefor avoid local minima.

For Power Point presentation, send a request to aehuggins@conservation-gis.org.

6   Annette Huggins (The Nature Conservacy) presented Marxan from a more technical point of view.

The input data is created as shape files in a GIS and presented to MARXAN as text files. The MARXAN input files are:
1. Target abundance: puvspr.dat
2. Targets details file: spec.dat
3. Boundary file: bound.dat
4. Planning unit file: pu.dat
5. Block definition file   optional

The region of interest is divided into planning units of a predefined size. Hexagonal planning units have been used with succes in many projects, but naturally units have also been

used.

MARXAN analysis can be run through the graphical interface Inedit.exe or directly through the text file Input.dat.
Another alternative is the on screen conservation tool CLUZ. http://www.mosaic-conservation.org/cluz/index.html. This is an extension to ESRI ArcView 3, which can be used to run MARXAN (with some limitation). CLUZ can also be used in the post analysis process to remove units and identify equally suitable units a concept named "on screen conservation planning". The outputs from MARXAN are text files, which can be brought back to a GIS to map results. An important post analysis is the irreplaceability analysis. This process evaluates which units are chosen repeatably. Irreplaceable units are identified as well as the reason for their irreplaceability.
For Power Point presentation send a request to aehuggins@conservation-gis.org.

7   Per Nilsson (TMBL) facilitated the discussions on methodology and criteria for site selection in the Baltic Sea. The workshop **agreed** to focus on making a preliminary list on ecological criteria (targets and goals) during the workshop (see annex 3 to the minutes).

The list of criteria and data requirements will be attached to the minutes as annex 3

Ecological criteria in this context consist of <u>targets</u> (= species, habitats or features that should be represented in the network) and goals (= how much of each target that should be included). For example we might wish to include 30 % (<u>goal</u>) of the coastal lagoons (<u>target</u>) in the Baltic Sea.

Physical factors and landscapes   The first group of criteria to be discussed and listed were physical factors defining the Baltic Sea landscapes.

Jørgen Leth, (GEUS WP2 leader) considered the list of physical factors very similar to the WP2 list of data requirements for landscape mapping. It was **concluded** that the WP3 evalua-

tion of representativity on landscape level will be done primarily based on the WP2 landscape maps, but with the possibility to include other separate physical factors in the analysis.

Greger Lindeberg, (SGU WP1 leader) pointed out that all available data layers will be available through the BALANCE portal metadata base.

The question of how to include already existing data from other projects into BALANCE was raised. For example, according to Cecilia Lindblad, SEPA has a project running dealing with landscape modelling. It was **concluded** that it is important to include already existing models, but it might be difficult if the existing models are done at different scales.

Bigeographic regions

The workshop participants decided to follow the already defined regions in the Baltic Sea (according to the HELCOM definition), which means 5 different regions, specified in the attached spread sheet.

It was **agreed** that the analysis on representativity must be done in a way that secure the representativity of each biogeographic region for each target (when ever relevant).

Habitats:

The mapping and level of detail at pilot area level was discussed. Jørgen Leth pointed out that at this stage it is very difficult to know in which detail the pilot areas will be mapped. It depends mainly on data availability. The outcome may be that only parts of the pilot area will be covered on habitat level and the remaining part only at an intermediate level. It was stressed that for the MARXAN analysis, habitat maps with the same resolution covering the whole pilot area are necessary.

It was mentioned that the habitat modelling will be done in different ways depending on the area in concern. Ulf Bergström (NBF) will provide a list of fish species included in the fish habi- List of fish species for pilot area

tat modelling for pilot area 3. The list will be distributed to all participants.

The data available in the different pilot areas were discussed. Summary of data availability in the 4 pilot areas:
 P1: benthic habitats, coastal fish habitats, EUNIS-habitats
 P2: potential offshore spawning areas?
 P3: benthic habitats, fish habitats (Ulf), EUNIS-habitats?
 P4: benthic habitats, EUNIS-habitats, Natura 2000 habitats

There is also a difference in the number of protected areas in the pilot areas. Pilot area 1 and 3 have several protected areas while pilot area 2 does not include any Natura 2000 sites. In sites with more protected areas, there might be more data available. It was also mentioned that some Natura 2000 sites include more habitats then they are designated for. It was also **underlined** that for the analysis it is crucial that there are a number of protected areas in the pilot sites.

There was a discussion on which Natura 2000-habitats should be included in the MARXAN analysis on Baltic Sea level as well as on pilot area level. There was a **general consensus** that only Natura 2000 habitat types below the surface are relevant. It was agreed to include all such Natura 2000 habitat types in the MARXAN analysis in the pilot areas, but only Natura 2000 habitat types with well known distribution in the analysis on Baltic Sea level. Georg Martin (EMI) will compile a preliminary list of the Natura 2000 habitats to be included in the analysis on Baltic Sea level. The list will be sent out to all workshop participants.

It was mentioned that there is an ongoing harmonization of the definitions of Natura 2000 habitats. Different countries interpretate the definitions in different ways. It was **decided** that the official EU definitions and interpretations should be used.

The inclusion of the EUNIS-habitat in the analysis was discussed. Annelie Mattisson (Stockholm County Administration) **underlined** the complexity of the EUNIS habitat classification system. It was **decided** that EUNIS will be included in the analysis, but only on pilot area level.

Species: The list of species was only discussed briefly and it was **decided** that a more detailed list should be prepared by Åsa Andersson, Anna-Sara Liman and Per Nilsson. The list will be sent out to all participants for comments etc.

It was **agreed** that the species in the EU Habitat Directive (seals and harbour porpoise) will be included both at Baltic Sea level and pilot area level, but that other species (e.g. species on the HELCOM redlist) are relevant only on pilot area level. Seals and harbour porpoise are species with large home ranges. This needs to be considered during the development of the species targets and goals.

Other targets: Other targets apart from biodiversity such as geological features and cultural heritage were also discussed. According to Annette Huggins (TNC) targets such as cultural heritage can be included in the network by locking them into the network structure.

There was also a discussion on how many targets it is possible to include, as well as the effect of overlapping targets. Annette Huggins considered 1000 targets as an upper limit, but it is strongly recommended not to include more targets than necessary, since the computation time increases every time the target amount increases.

Other criteria   Other criteria such as size, connectivity and number of replicas were discussed. It was **concluded** that lack of ??? will limit

<mark>where these targets can be included in the analysis.</mark>

A minimum number of patches do not have to be set according to Annette Huggins. The representation of the bio-geographic regions will provide a minimum of five replicas for the whole region. A minimum number of patches can not act as a substitute for target goals on % level.

The partners who are responsible for the coherence analysis in WP3 will investigate the possibility to use MARXAN during the analysis. The minimum separation between patches might be a part of this analysis.

Summary: To sum up the discussion: It was concluded that the targets for the network had been discussed and a preliminary list of targets and data requirements had been compiled. Specified goals for each target were not discussed yet. It was therefor decided that a more detailed listing on both targets and goals will be done by Åsa Andersson, Anna-Sara Liman and Per Nilsson. The list will be sent out to all participants for comments etc.

9. Annette Huggins (The Nature Conservacy) presented a concept for incorporation of socio-economic factors into the analysis. A cost surface can be applied and the goal is to steer the program to or away from areas i.e. from unsuitable sites such as sand-and gravel extraction.

Following this presentation was a discussion on the inclusion of socio-economic/excluding criteria in WP3. There was an overall **agreemen**t that there is a need for communication between WP3 and WP4 on which factors are to be included in the MARXAN analysis. It was however **decided** that exclusion of unsuitable sites should be part of the representativity analysis in WP3. The eventual use of MARXAN for zoning should, how-

Preliminary list on excluding criteria

ever, be part of WP4.

10   Annette Huggins and Chris Sheppard were altogether satisfied with our progress on developing a method adjusted for the Baltic Sea. They encouraged us to proceed in making the list of targets and goals more detailed and to keep a continuos dialog with authorities and experts. Finally they wished us good luck with the BALANCE project.

The meeting was closed.

Attachments:
Annex 1: List of Participants Annex
Annex 2: Agenda Annex
Annex 3: Ecological criteria for the Baltic Sea network

Annex 1: List of participants

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Annex 2: Agenda for the workshop

15th of September

Chair/facilitator: Åsa Andersson, WWF / Per Nilsson, TMBL

10.00-10.30	Welcome. Introduction. + Aim of the workshop (Åsa Andersson, WWF)
10.30-11.00	Presentation of the BALANCE-project (Johnny Reker, SNS)
11.00-11.30	Presentation of BALANCE WP3 (Åsa Andersson, WWF)
11.30-12.00	The Baltic Sea – characteristics (Cecilia Lindblad, SEPA)
12.00-13.00	LUNCH
13.00-14.00	Marxan – an overview (Annette Huggins).
14.00-15.00	Marxan – technical information (Annette Huggins).
15.00-15.30	(Tea/Coffee)
15.30-18.00	Developing a methodology for site selection in the Baltic Sea – ecological criteria and data requirements

16th of September

Chair/facilitator: Per Nilsson, TMBL

9.00-12.00   Developing a methodology for site selection in the Baltic Sea
            -ecological criteria and data requirements
-Conservation targets
-Conservation goals
      -the proportions of conservation targets required to be sufficiently
      represented in the network
      -replications of conservation targets
      -different scenarios interesting for stakeholders
-Data requirements
      -type of data
      -data format (vector vs. raster data)
      -data quality and resolution
-Planning units
      -Size and format

12.00-13.00	LUNCH
13.00-14.30	Modifying criteria (Annette Huggins)
14.30-15.00	(Tea/Coffee)
15.00-15.45	Inclusion of socio-economic factors (Annette Huggins)
15.45-17.00	Discussion - upcoming issues
	Summary and advice from TNC