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### Background

The HELCOM seal database has been further developed under the HELCOM coordinated EU co-financed project BalticBOOST in WP1.2 'Biodiversity databases' with NRM and Århus University as subcontractors.

This document summarizes the work done so far in relation to data format development and data entry tool and presents the draft version of the web application tool.

### Action requested

The Meeting is invited to provide comments and guide work in relation to seal database developments.

## Development of a database for seals

### Background

The first step to produce a harmonized seal database was taken in the BALSAM project (2013-2015) which contained a work package that provided distribution (GPS tracks) and abundance (counts per area) database for grey seal, harbour seal and ringed seal data. The data files (excel) and resulting data products (gridded GPS track maps) are available on [HELCOM web page](#).

To further develop the seal data flow arrangements, the BalticBOOST WP 1.2 was tasked to develop the following enhances:

- Database format
- Reporting guidelines
- Data entry tool
- System for regular data product extraction from the database based on the assessment protocols defined in the core indicators. The data products are to be extracted to the HELCOM Map and Data service.

### Developed format for abundance/distribution

#### Abundance data

One of the main task of BalticBOOST project was to develop a format for collecting and storing data on seal surveys which would fulfill the following needs:

- Enabling pointwise collection of data
- Be harmonized with OSPAR equivalent format (currently in development)

The format has been developed and is utilized in the database for Danish test data. The data is stored to the database as a set of tables using relational database structure.

Table 1. Format for abundance data as displayed in the database web application and in the data request.

Column name	Data Type	Comment
ID	Integer	Unique id needed for the table
SpeciesID	Text	Code list harmonized with OSPAR (HS, GS, RS)
Country	Text	European union two character country designation (e.g. UK, FR, DE, NL) (Code list harmonized with OSPAR)
Site	Integer	Site table would contain all info related to location, coordinates, areas and assessment units.
Latitude	Double	Latitude as in WGS84 decimal degrees (harmonized with OSPAR)
Longitude	Double	Longitude as in WGS84 decimal degrees (harmonized with OSPAR)
Natura2000ID	Text	ID of Natura2000 area, if site is within N2000 area
Year	Integer	
Month	Integer	
Day	Integer	
Count	Integer	
Count_type	Text	To indicate whether count is based on site observation or transect survey (ringed seal)
Estimate_type	Integer	Maximum/modelled (Code list harmonized with OSPAR)

		Please provide any available estimates of the variability in repeated counts in the form of the coefficient of variation (standard deviation / mean) of replicate counts (Code list harmonized with OSPAR)
CV_Estimate	Integer	
Number_surveys	Integer	
Method	Text	
Source	Text	optional; please use to identify data source (e.g. NGOs) (Code list harmonized with OSPAR)

### Reporting of abundance/distribution data to the database

The data that is required for the update of HELCOM core indicators on abundance and distribution of seals was requested to be reported to the Secretariat using the format outlined in Table 1 and Attachment 1 of this document. A separate data call was submitted to the Seal EG on reporting this data.

The reporting was decided to be based on excel template format due to expected large amount of rows. Once the data is uploaded to the HELCOM Seal database, it can be edited by the national data providers (e.g. Danish contact can edit Danish data, Figure 1) in case there will be corrections needed. A form-based reporting can be developed for future reporting rounds, where only annual updates are requested and the number of rows to report is considerably smaller.

Figure 1. Abundance data editing form for a logged-in user.

### Distribution data (GPS tracks)

The data on GPS track data on distribution from BALSAM project was also transferred into a table format and included in the database. (Table 2, Figure 2).

Table 2. Distribution GPS track data format.

Column name	Data Type	Comment
ID	Integer	Unique id needed for the table
OID	Integer	
Country	Integer	
XMIN	Integer	
YMIN	Integer	
Latitude	Double	
Longitude	Double	
Species	Text	

Age	Integer
Year	Integer
Month	Integer

### Output of indicator results for biodiversity assessment tool (BEAT)

The HELCOM Seal database can be used for both storing underlying data used in the indicator assessment but also for making available indicator results. BalticBOOST WP1.1 has been developing a biodiversity assessment tool (BEAT) which is an R-script taking indicator results as an input and producing integrated biodiversity assessment result as an output.

The BEAT script sets also a format requirement on how indicator results should be structured. The table “Indicator results” is planned to be constructed in a way that the data from that table can be used for input to the BEAT tool, containing the required fields as outlined by BalticBOOST WP1.1 (Table 3). A guidance document on preparing indicator results to BEAT input table format is under preparation by BalticBOOST WP 1.1.

A form-based editor will be created for populating the indicator result table with required columns.

Table 3. Columns and description of seal indicator outputs to BEAT.

Column	Data type	Description
Indicator name	Text	Name of indicator
Ecosystem_component	Text	Ecosystem component related to indicator (list will be provided)
Spatial assessment unit	Text	Spatial assessment unit (e.g. HELCOM Subbasin: “Gulf of Finland”)
Unit	Text	Unit of the indicator value, e.g. “individuals”
Type	Number	Indicator type: 1=increasing/decreasing indicator value show improved status, 2=unimodal indicator with optimal range (most indicators will be of type 1)
Bad	Number	Minimum or maximum indicator value (showing bad status), see instructions on how to define min-max values
ModGood	Number	GES boundary
High	Number	Maximum or minimum indicator value (showing high status), instructions on how to define min-max values will be provided
ModGood2	Number	Used only for type 2 indicators, upper limit of the optimal range
Bad2	Number	Used only for type 2 indicators, highest indicator value (showing bad status)
Obs	Number	Observed indicator value, the indicator result
StdErr	Number	Standard error of the indicator result (if available)
ConfA	Text	Confidence of classification (if standard error is not available). Classified as: High, Intermediate or Low (instructions for confidence assessment will be provided)
ConfT	Text	Temporal coverage of indicator data in the assessment. Classified as: High, Intermediate or Low (instructions for confidence assessment will be provided)
ConfS	Text	Spatial representability of indicator data in the assessment. Classified as: High, Intermediate or Low (instructions for confidence assessment will be provided)
ConfM	Text	Methodological confidence. Classified as: High, Intermediate or Low (instructions for confidence assessment will be provided)

## Seal database web application

The draft web application can be accessed at <http://bio.helcom.fi/seals>

The web application is structured in to following sheets/pages:

- Home
- Indicator results
- Abundance
- Sites
- Distribution
- Species
- Map

### Home page

Landing page for the seal database web application available at <http://bio.helcom.fi/seals> (Figure 2). The page will contain general description of the data and links to relevant HELCOM documentation, e.g. Monitoring Manual, indicator pages and Seal EG page.

On the upper right corner there is a “Login” functionality. A logged in user (National user ids and passwords will be provided personally) can edit information and access distribution page, e.g. Danish contact can edit Danish abundance data).

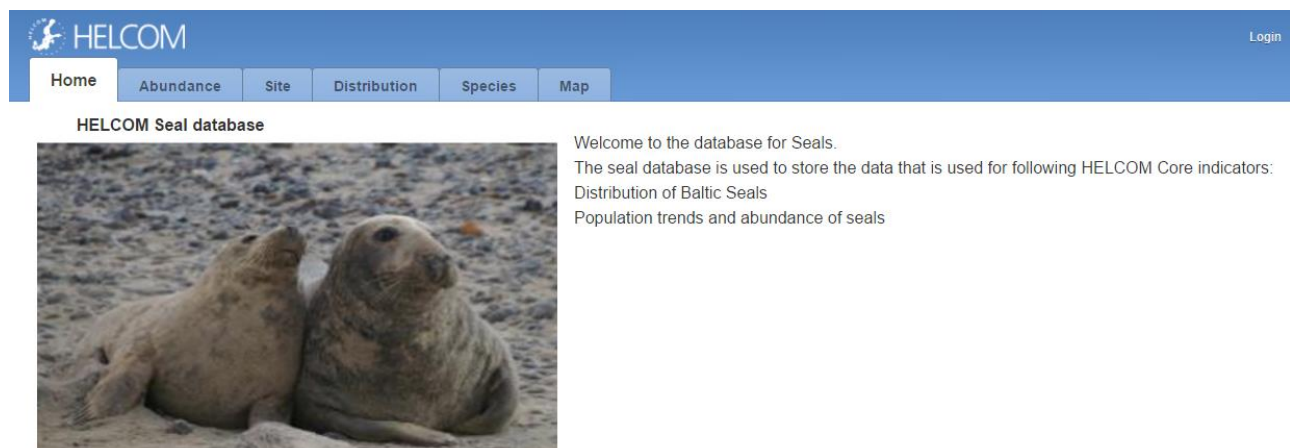


Figure 2. Seal database web application home page.

### Indicator results page

Indicator results page (to be completed) will contain results of indicators produced for a certain assessment period. This would be input to the integrated biodiversity assessment tool (BEAT, see Table 3).

The indicator results page would also contain a query returning all raw data from abundance table used for calculating the indicator results.

### Abundance page

Abundance page contains a table with all the reported data on seal counts used for abundance and distribution as reported using the reporting format. The table can be filtered by different attributes (Country,

Species, Site) and downloaded as csv files (Figure 3). The Site-column contains a link to a dynamic map viewer zooming into the location of the site coordinates.

A logged in user can edit the information (Figure 1).

edit	Country	Site	Helcom subbasin	Area	Management unit	Species	Year	Month	Day	Count	Age	Cv estimate	Number of surveys	Method	Latitude	Longitude
-	Denmark	<a href="#">Anholt_Totten</a>	Kattegat	Kattegat	-	Harbour seal	1979	8	-	248	-	-	1	Aerial survey	56.73625	11.661028
-	Denmark	<a href="#">Anholt_Totten</a>	Kattegat	Kattegat	-	Grey seal	1979	8	-	0	-	-	1	Aerial survey	56.73625	11.661028
-	Denmark	<a href="#">Bosserne</a>	Great Belt	Kattegat	-	Harbour seal	1979	8	-	0	-	-	1	Aerial survey	55.936444	10.776556
-	Denmark	<a href="#">Bosserne</a>	Great Belt	Kattegat	-	Grey seal	1979	8	-	0	-	-	1	Aerial survey	55.936444	10.776556
-	Denmark	<a href="#">Hessele</a>	Kattegat	Kattegat	-	Harbour seal	1979	8	-	434	-	-	1	Aerial survey	56.201778	11.688
-	Denmark	<a href="#">Hessele</a>	Kattegat	Kattegat	-	Grey seal	1979	8	-	0	-	-	1	Aerial survey	56.201778	11.688
-	Denmark	<a href="#">Læse Knobgrundene</a>	Kattegat	Kattegat	-	Harbour seal	1979	8	-	0	-	-	1	Aerial survey	57.264028	11.160222
-	Denmark	<a href="#">Læse Knobgrundene</a>	Kattegat	Kattegat	-	Grey seal	1979	8	-	0	-	-	1	Aerial survey	57.264028	11.160222
-	Denmark	<a href="#">Læse-Borfeld</a>	Kattegat	Kattegat	-	Harbour seal	1979	8	-	107	-	-	1	Aerial survey	57.354556	10.901667
-	Denmark	<a href="#">Læse-Borfeld</a>	Kattegat	Kattegat	-	Grey seal	1979	8	-	0	-	-	1	Aerial survey	57.354556	10.901667
-	Denmark	<a href="#">Læse-Nordkysten</a>	Kattegat	Kattegat	-	Harbour seal	1979	8	-	0	-	-	1	Aerial survey	57.330444	11.145361
-	Denmark	<a href="#">Læse-Nordkysten</a>	Kattegat	Kattegat	-	Grey seal	1979	8	-	0	-	-	1	Aerial survey	57.330444	11.145361

Figure 3. Abundance data table.

### Sites page

Sites page contains a list of all sites with the following information/functionality per site (Figure 4):

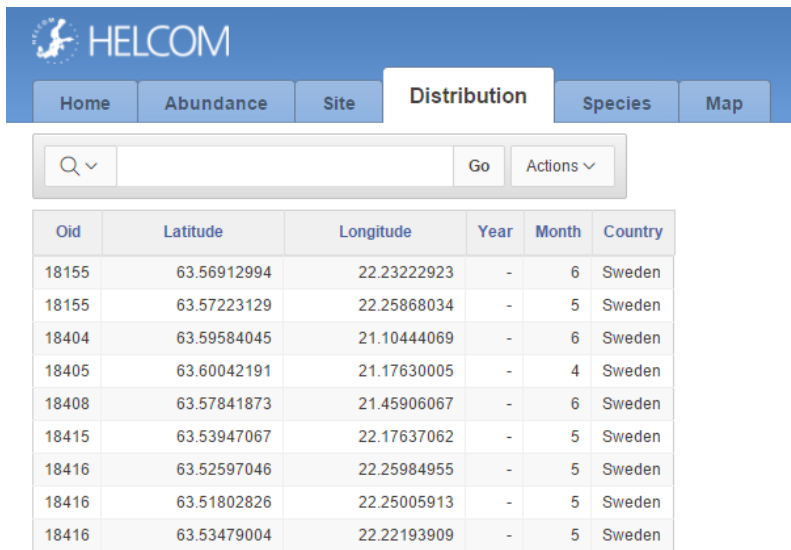
- Clickable map viewer window
- WGS84 decimal degrees coordinates of the site
- Natura2000 ID and link to Natura2000 standard data form, if the site is located within N2000 area
- HELCOM MPA ID and link to HELCOM MPA fact sheet, if the site is located within a HELCOM MPA
- Information on country, area and HELCOM Subbasin where the site is located within.

Editlink	Site	Area	Country	Managementunit	N2000 id	N2000 Link	Helcommpa id	Helcommpa Link	Helcom subbasin	Longitude	Latitude
-	<a href="#">Aqger Tange</a>	Limfjorden	Denmark	-	DK00EY133	<a href="#">N2000Site</a>	-	Not within an MPA	Kattegat	8.244	56.7
-	<a href="#">Amaager SO</a>	WesternBaltic	Denmark	-	DK002X111	<a href="#">N2000Site</a>	273	<a href="#">MPA</a>	Arkona basin	12.609028	55.555917
-	<a href="#">Anholt_Flakket</a>	Kattegat	Denmark	-	DK00DX146	<a href="#">N2000Site</a>	244	<a href="#">MPA</a>	Kattegat	11.529722	56.724139
-	<a href="#">Anholt_Totten</a>	Kattegat	Denmark	-	DK00DX146	<a href="#">N2000Site</a>	244	<a href="#">MPA</a>	Kattegat	11.661028	56.73625
-	<a href="#">Aune Fjord</a>	WesternBaltic	Denmark	-	DK006X234	<a href="#">N2000Site</a>	186	<a href="#">MPA</a>	Great Belt	11.770833	55.067167
-	<a href="#">Blinderen</a>	Limfjorden	Denmark	-	DK00EY124	<a href="#">N2000Site</a>	-	Not within an MPA	Kattegat	9.013	56.901
-	<a href="#">Bosserne</a>	Kattegat	Denmark	-	DK00DX155	<a href="#">N2000Site</a>	130	<a href="#">MPA</a>	Great Belt	10.776556	55.936444
-	<a href="#">Bøgestrommen</a>	WesternBaltic	Denmark	-	DK006X233	<a href="#">N2000Site</a>	264	<a href="#">MPA</a>	Arkona basin	12.221639	55.073694
-	<a href="#">Christianse</a>	WesternBaltic	Denmark	-	DK007X079	<a href="#">N2000Site</a>	184	<a href="#">MPA</a>	Bornholm basin	15.176139	55.329056
-	<a href="#">Dyrefod</a>	WesternBaltic	Denmark	-	DK006X238	<a href="#">N2000Site</a>	-	Not within an MPA	Great Belt	11.805639	54.971111
-	<a href="#">Eierslev Ren</a>	Limfjorden	Denmark	-	DK00EY124	<a href="#">N2000Site</a>	-	Not within an MPA	Kattegat	8.953583	56.936917
-	<a href="#">Falster NV</a>	WesternBaltic	Denmark	-	DK006X238	<a href="#">N2000Site</a>	-	Not within an MPA	Great Belt	11.703611	54.943972
-	<a href="#">Falsterbo**</a>	WesternBaltic	Denmark	-	-	Not a natura2000 site	-	Not within an MPA	Arkona basin	12.810556	55.365667
-	<a href="#">Flintehorne Odde</a>	WesternBaltic	Denmark	-	DK006X238	<a href="#">N2000Site</a>	-	Not within an MPA	Bay of Mecklenburg	11.809306	54.639528
-	<a href="#">Gærup Ore</a>	Limfjorden	Denmark	-	DK00EY133	<a href="#">N2000Site</a>	-	Not within an MPA	Kattegat	8.628833	56.678028
-	<a href="#">Hessele</a>	Kattegat	Denmark	-	DK003X202	<a href="#">N2000Site</a>	131	<a href="#">MPA</a>	Kattegat	11.688	56.201778
-	<a href="#">Hvalpsund</a>	Limfjorden	Denmark	-	DK00EY124	<a href="#">N2000Site</a>	-	Not within an MPA	Kattegat	9.131806	56.8595
-	<a href="#">Jungshoved N</a>	WesternBaltic	Denmark	-	DK006X233	<a href="#">N2000Site</a>	264	<a href="#">MPA</a>	Arkona basin	12.163944	55.124611
-	<a href="#">Læse Knobgrundene</a>	Kattegat	Denmark	-	DK00FX010	<a href="#">N2000Site</a>	134	<a href="#">MPA</a>	Kattegat	11.160222	57.264028
-	<a href="#">Læse Syd</a>	Kattegat	Denmark	-	DK00FX010	<a href="#">N2000Site</a>	134	<a href="#">MPA</a>	Kattegat	11.058611	57.185833

Figure 4. Sites table.

## Distribution page

Distribution page display GPS Track data collected in the BALSAM format as in tabular data (Figure 5). Note that for the time being distribution data is behind a password.

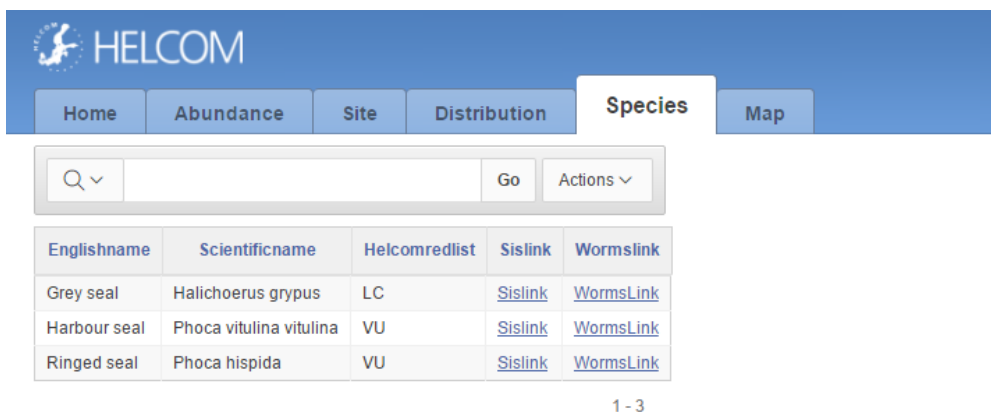


Oid	Latitude	Longitude	Year	Month	Country
18155	63.56912994	22.23222923	-	6	Sweden
18155	63.57223129	22.25868034	-	5	Sweden
18404	63.59584045	21.10444069	-	6	Sweden
18405	63.60042191	21.17630005	-	4	Sweden
18408	63.57841873	21.45906067	-	6	Sweden
18415	63.53947067	22.17637062	-	5	Sweden
18416	63.52597046	22.25984955	-	5	Sweden
18416	63.51802826	22.25005913	-	5	Sweden
18416	63.53479004	22.22193909	-	5	Sweden

Figure 5. Distribution data.

## Species page

Species page contains additional information on seal species, listing a species English name, scientific name, HELCOM Red List status of the species and links to HELCOM Species Information Sheet and WoRMS (World Registry of Marine Species) (Figure 6).



Englishname	Scientificname	Helcomredlist	Sislink	Wormslink
Grey seal	Halichoerus grypus	LC	<a href="#">Sislink</a>	<a href="#">WormsLink</a>
Harbour seal	Phoca vitulina vitulina	VU	<a href="#">Sislink</a>	<a href="#">WormsLink</a>
Ringed seal	Phoca hispida	VU	<a href="#">Sislink</a>	<a href="#">WormsLink</a>

1 - 3

Figure 6. Species table (headings to be modified).

## Map page

Map page is planned to be used for displaying spatial data on seals such as count site locations and indicator result maps (when completed) (Figure 7).

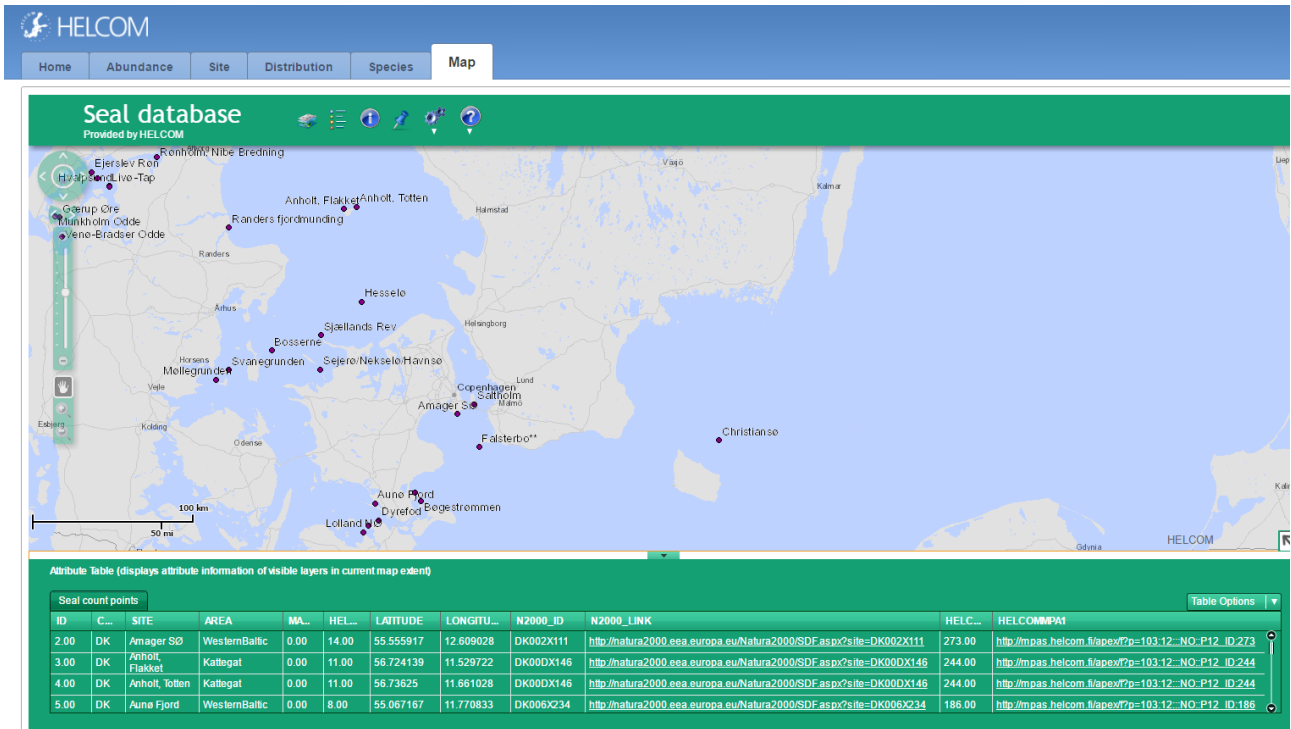


Figure 7. Map viewer of HELCOM Seal count sites (Danish sites included for display).