Stage 1 Report:

Comparison study and requirements

MAIA and OSPAR MPA database comparison and pooling scenarios

January 2013

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1.1   Context and aims

There are many programmes and conventions on marine protected areas, ranging from a local to the transnational scale. Examples include:

- The MAIA cooperation programme (Marine Protected Areas in the Atlantic Arc)
- The OSPAR Convention, for the protection of the North-East Atlantic.

As part of their respective missions, the MAIA programme and the OSPAR Convention work to establish networks of stakeholders involved in marine protected areas and they use common data themes.

By pooling and sharing information or technical infrastructure, each entity's action can be optimized:

- OSPAR wishes to improve data reliability through more simple collection processes and facilitate dissemination.
- MAIA needs the OSPAR Commission's data to populate its own database.

Aware of the possible added value, the two entities wish to study the feasibility and scope of a potential pooling of their databases and respective intelligence tools.

1.2   Study methods

The study of the technical and functional pooling conducted prior to drafting this report was based on:

- A study of the documents and data provided by the entities:
    - o MAIA and OSPAR
- Telephone conservations that gave rise to reports approved by the interviewees.

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1.3   Scope and content of the report

Scope

The report covers the comparison of the MAIA and OSPAR databases with the following focuses:

- Technical
- Functional
- Organization
- Content

The report does not cover the background and institutional framework of the databases.

Content

The report comprises three sections:

- The first section (chapters 2 and 3) presents a review and a comparison of the two databases.
- The second section (chapter 4) recaps on the interviews conducted.
- The third section (chapters 5 and 6) proposes leads for development.

2.1 INSPIRE Directive

Presentation of the INSPIRE Directive

Aims

European Directive 2007/2/EC of 14 March 2007, called INSPIRE, (http://inspire.jrc.ec.europa.eu/) requires public and equivalent entities to publish their current and future digital spatial data relative to the environment within their remit.

The aim is to facilitate the exchange and sharing of geographic environmental information within the European Union Member States, by creating a European infrastructure for spatial information.

The expected benefits are as follows:

- Facilitate data **reporting** from the local level to European level
- Allow environmental data to be consulted
- Allow professionals to view and analyse the environmental information
- Make data available for download.

The INSPIRE Directive lays down the following obligations:

- Creation of a catalogue of standardized metadata (the structure and content of the fields making the catalogue "INSPIRO-compatible" are fully defined)
- Free online metadata catalogue consultation service
- Online data viewing and co-viewing
- Data download services, subject to certain conditions
- Data conversion services (reprojection)
- Use of 'INSPIRE' data models for certain data
  - o The use of data models common to all stakeholders guarantees data escalation and aggregation.

The Directive does not require:

- The creation of new data.
- The digitization of data existing in non-digital formats.

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Organization

The escalation of information to EU level is based on a pyramid approach:

- Data production by responsible entities, most often at local level
- Data catalogue referencing at higher levels:
    - Intermediate territorial levels (county, region, etc.)
    - Country

There must be only one entry point (**national focal point**) between the country and the European Community (EC). In France, this is the Ministry of the Environment.

European   National   Regional/County level   Local
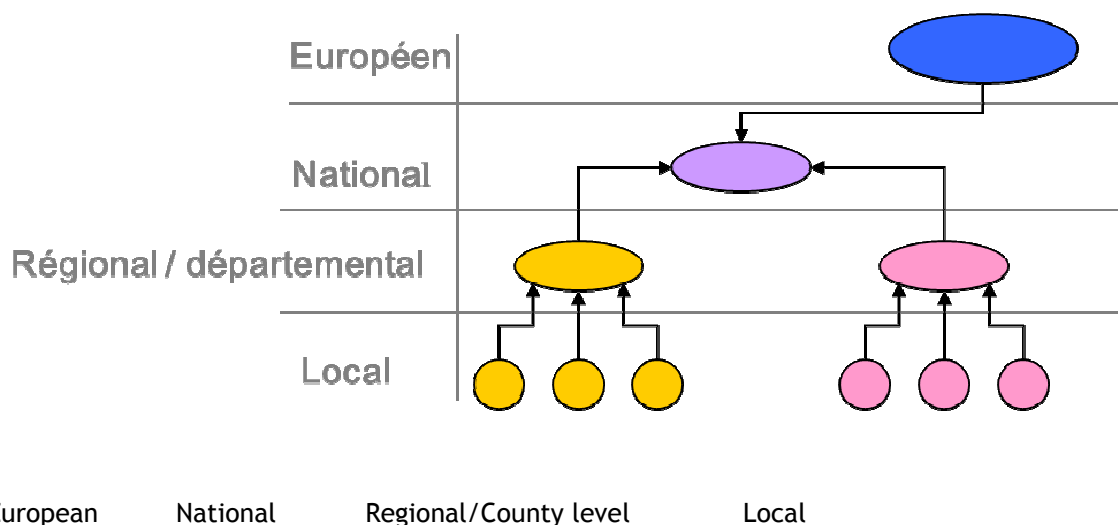
Timeframe

These obligations are implemented according to a gradual schedule in terms of services and data themes (Annexes I, II and III). Initiated in 2007, implementation of the Directive will take place through to 2020 (http://inspire.jrc.ec.europa.eu/index.cfm/pageid/44).

It should be added that the operational implementation of the INSPIRE Directive is progressive. There is a significant gap between the official schedule and achievements, particularly at sub-national levels.

Technical implementation

To ensure a high level of interoperability, the INSPIRE Directive relies on the following technical elements:

- Technical standards: OGC WEB services (WMS, WFS, etc.)
- ISO structuring and dissemination standards (XML), particularly for metadata (19115, 19139, etc.).

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- Data structures

The INSPIRE Directive does not impose any tools. Entities are free to choose the technical solutions they implement. Only technical and functional conformity is a requirement.

Entities responsible for data covered by the Directive are responsible for the operational implementation of the Directive. They may, as required, rely on infrastructures available at regional or national levels in accordance with the principle of subsidiarity.

Case of marine protected areas

Marine Protected Areas (MPA) are part of the '**Protected Sites**' theme included in **Annex I** of the Directive.

The Commission identified five use cases that implementation of the INSPIRE Directive must meet for protected sites:

- 1: Generation of reports on protected sites
- 2: Naively view and query data about protected sites at local, national or Europe-wide levels
- 3: Expertly view, query **and analyze** data about protected sites at local, national or Europe-wide levels
- 4: Download data for advanced uses (expert)
- 5: Provide data about protected sites in compliance with EU and EU Member States' legal obligations (reporting)
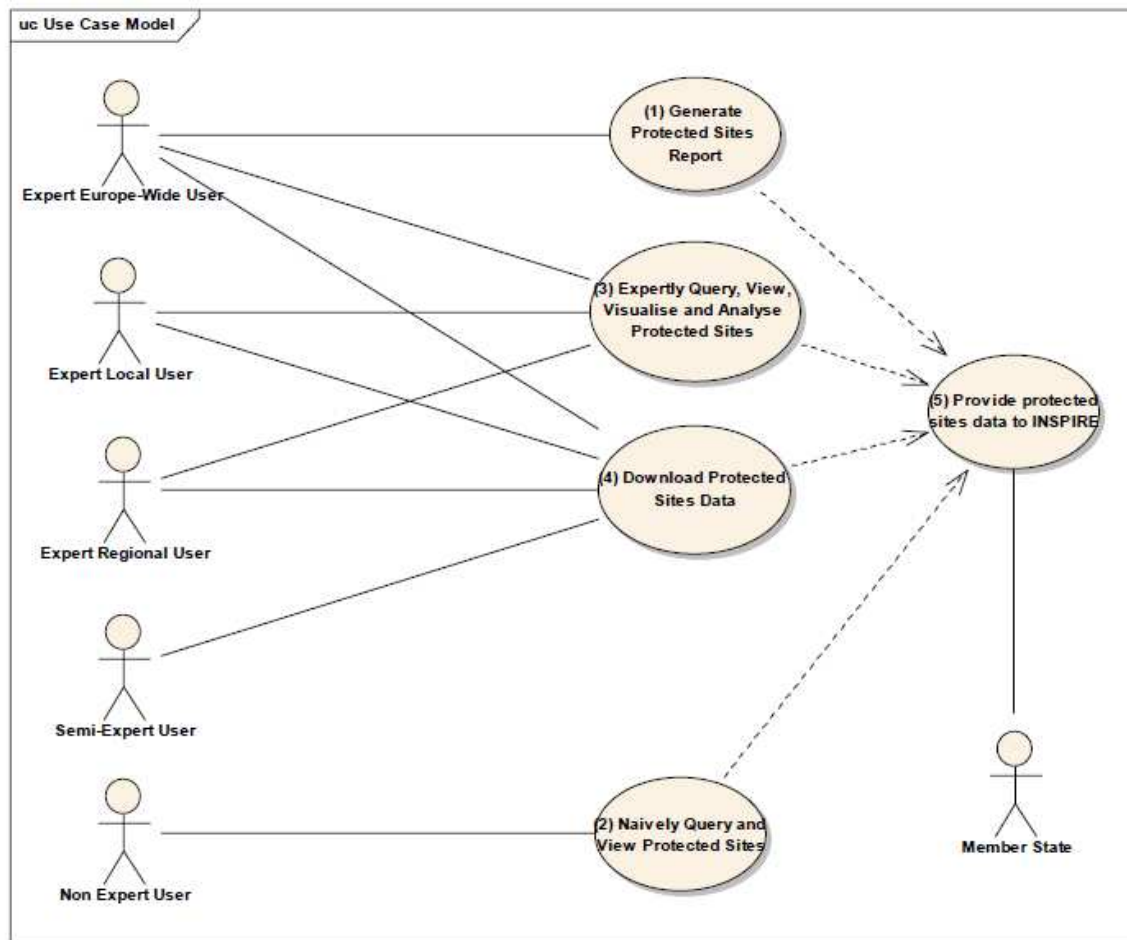
Impacts

Complying with the INSPIRE 'protected sites' data model is the obligation which most impacts the structure of data.

Two INSPIRE 'protected sites' data models are proposed:

- The Simple model
- The Full model

http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecification_PS_v3.1.pdf

Simple Model

The Simple data model only applies to current marine protected areas.

A marine area is described by a limited set of information:

Field	Description	Observation
Geometry	Perimeter of the marine area	Point, polygon
inspireID	INSPIRE identifier	INSPIRE identifier
legalFoundationDate	Creation date	Free entry
legalFoundationDocument	Legal reference documents	URL
siteDesignation	Type of designation	List of values
siteName	Site name	Free entry
siteProtectionClassification	Protection purpose	List of values

The data model is presented in the Appendix.

Full model

The Full data model applies to current or repealed marine protected areas. This data model therefore covers historical protected sites.

The 'Full' data model completes the 'Simple' model with a significant amount of information including, in particular:

- Habitats and biotopes
- Species and their distribution
- Protected site managers
- Management schemes

The data model is presented in the Appendix.

2.2   Marine Strategy Framework Directive (MSFD)

Objectives

The Marine Strategy Framework Directive (MSFD) (2008/56/EC – 17 June 2008) defines a framework for action in the field of marine environmental policy on a European scale.

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((http://europa.eu/legislation_summaries/maritime_affairs_and_fisheries/fisheries_resources_and_environment/l28164_fr.htm)

The Directive has three inter-linked goals:

- 1: Preserve, protect and, if necessary, restore marine ecosystems
- 2: Prevent and eliminate pollution
- 3: Ensure sustainable cohabitation of human activities and conservation of the marine environment

Actions

The Directive requires Member States to develop marine strategies, including the following actions to be taken in 2012:

- Assess the ecological status of their waters and the impact of human activities
- Define the 'good environmental status' (GES) of their waters
- Define Environmental Targets (ET) and related monitoring indicators

These strategic focuses are re-assessed every six years.

Interim reports shall be issued by the Member States every three years.

Implementation dates are:

- July 2012: Initial evaluation
- July 2014: Definition then implementation of monitoring actions
- July 2015 – 2016: Definition then implementation of a programme of measures

Impacts

The MSFD will require rapid and reliable reporting processes from the local level (data acquisition) to the European level via the competent authorities defined nationally, at each step in the aggregation and consolidation of data. **National focal points** will forward the data to the European level.

2.3   Summary

The 'Marine protected areas' theme is directly concerned by two recent European regulatory developments:

- The INSPIRE Directive
- The Marine Strategy Framework Directive

The INSPIRE Directive will require entities responsible for MPAs to provide structured information (catalogue of metadata, Web services and data

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downloading) about marine protected areas in line with standards and data models compliant with the Directive.

Pursuant to the MSFD, MPA responsible entities will be required to perform careful monitoring and to report on such monitoring to EU level.

These two Directives apply to the relevant authorities of the EU Member States and therefore in their area of jurisdiction.

Although their objectives differ, INSPIRE and the MSFD both involve reporting by responsible entities from a local to a national and then the European level.

The involvement of national focal points is essential to comply with INSPIRE and MSFD implementation.

The MAIA programme and the OSPAR Convention (except for marine protected areas beyond national jurisdiction (ABNJ) are not responsible for the management of marine protected areas. MAIA and OSPAR therefore depend directly on the national focal points to fulfil their missions by populating their respective databases.

3.1   MAIA Project and OSPAR Convention

MAIA

The MAIA project aims to create a network for exchange between MPA managers and stakeholders in the Atlantic arc. Four countries are involved: Portugal, Spain, France and the UK.

The programme was initiated early in 2010 and was completed, as it stands today, at the end of 2012. Funded via the Interreg programme, the MAIA project was led by the French *Agence des aires marines protégées* (Ministry of the Environment - France).

The establishment of the network led, inter alia, to the creation of a website (www.maia-network.org) featuring a conventional information section (editorial content, newsletter, etc.), a collaborative documentary space and a dynamic mapping tool with a spatial database (GIS).

In addition to describing marine protected areas (name, surface area, foundation date, etc.) officially designated by the Atlantic arc countries (national and international designations), the MAIA project database also integrates information about MPA management.
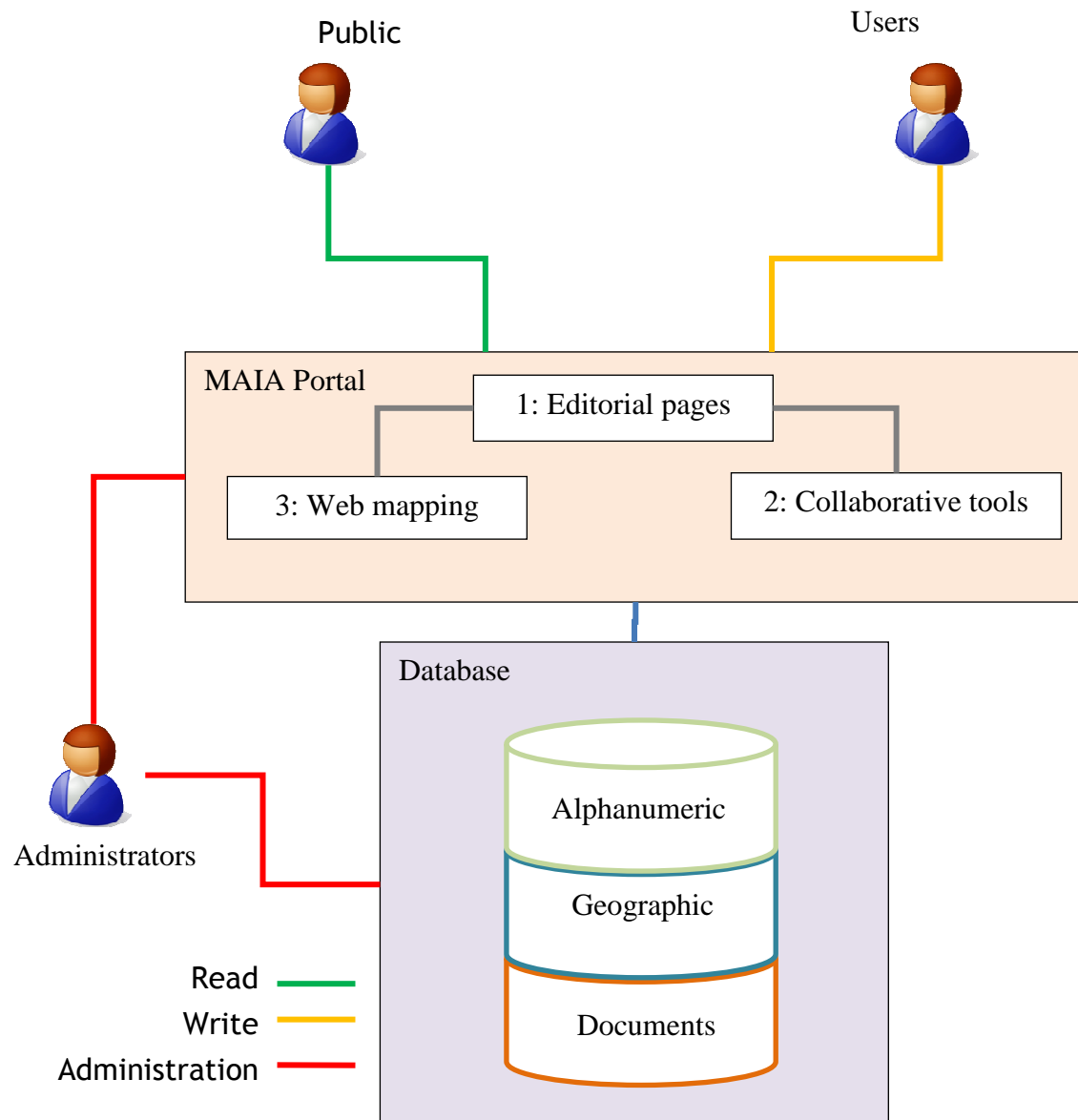
OSPAR

OSPAR (http://www.ospar.org/) is a regional seas convention governing international cooperation on the protection of the marine environment of the North-East Atlantic and particularly 'offshore' sites beyond national jurisdiction ('ABNJ'). Its implementing body is the OSPAR Commission.

Developing a network of marine protected areas is one of its strategic missions.

The OSPAR Commission has developed a strictly attribute database in MS Access. The database lists and describes marine protected areas designated under the OSPAR Convention. It includes MPAs under and beyond national jurisdiction (ABNJ).

3.2   Technical and functional aspects

Technical

The MAIA and OSPAR databases are established in very different technical environments.

Criteria	OSPAR	MAIA
Implementation	MS Access	Web application installed on a centralized server, hosted in France
Storage mode	MS Access proprietary file	RDBMS PostGRESQL/PostGIS (OpenSource solution)
Operating tool	MS Access forms	Specifically developed interface
Access	Single-user in read and write access (technical requirement)	Multi-user in read and write access with user identification.

Functional field

The functional fields of the operating tools will not be set out in detail here, solely outlined.

Criteria	OSPAR	MAIA
Consultation	• Access data-consultation forms • Queries and summaries by country via the MS Access functions.	• Consultation forms • Search forms • Summaries, queries and attribute and spatial statistics (predefined and on demand) • Dynamic map
Update	• OSPAR data update via dedicated Access forms (local). • Natura 2000 data import functions from MS Access.	• Online update functions • Geometry import functions • Use of WFS and WMS Web services
Distribution	• Production of reports by country, by type of site, by category (OSPAR, Natura 2000), etc.	• Online data export (attribute and geographic) • Document download • Online map editing
Comments	The native functions of MS Access remain accessible (new queries can be defined). The OSPAR tool can therefore change quickly to suit needs, subject to having the required skills: • Data export • Adding reports, queries, statements, etc. • Etc.	The MAIA site is positioned as a real platform for sharing where information is centralized.

Analysis and comments

The MAIA site is positioned as a real platform for sharing, which centralizes information and offers Web-accessible update functions. Advanced technical skills are required to maintain and develop the MAIA portal (Web development, database, etc.).

The OSPAR tool makes full use of the MS Access capacities with advantages:

- Ease of implementation
- Structured data storage
- Consultation and update functions

and drawbacks:

- File in proprietary format;
- Single user.

The native functions of MS Access remain accessible (new queries can be defined). The OSPAR tool can therefore change quickly to suit needs, subject to having the required skills:

- Data export
- Adding reports, queries, statements, etc.
- Etc.

3.3   Updating process

OSPAR database populating

The team in charge of the OSPAR MPA database (BfN – Germany) periodically sends the national focal points the 'OSPAR MPA' (MS Access) database file. The national focal points update the database and return the MS Access file to the team in charge of the database, which integrates the data into the Access reference base, then performs analyses and produces reports that are sent to the national focal points.

Data collection is annual in theory.

OSPAR	National focal point	MAIA	MPA Managers
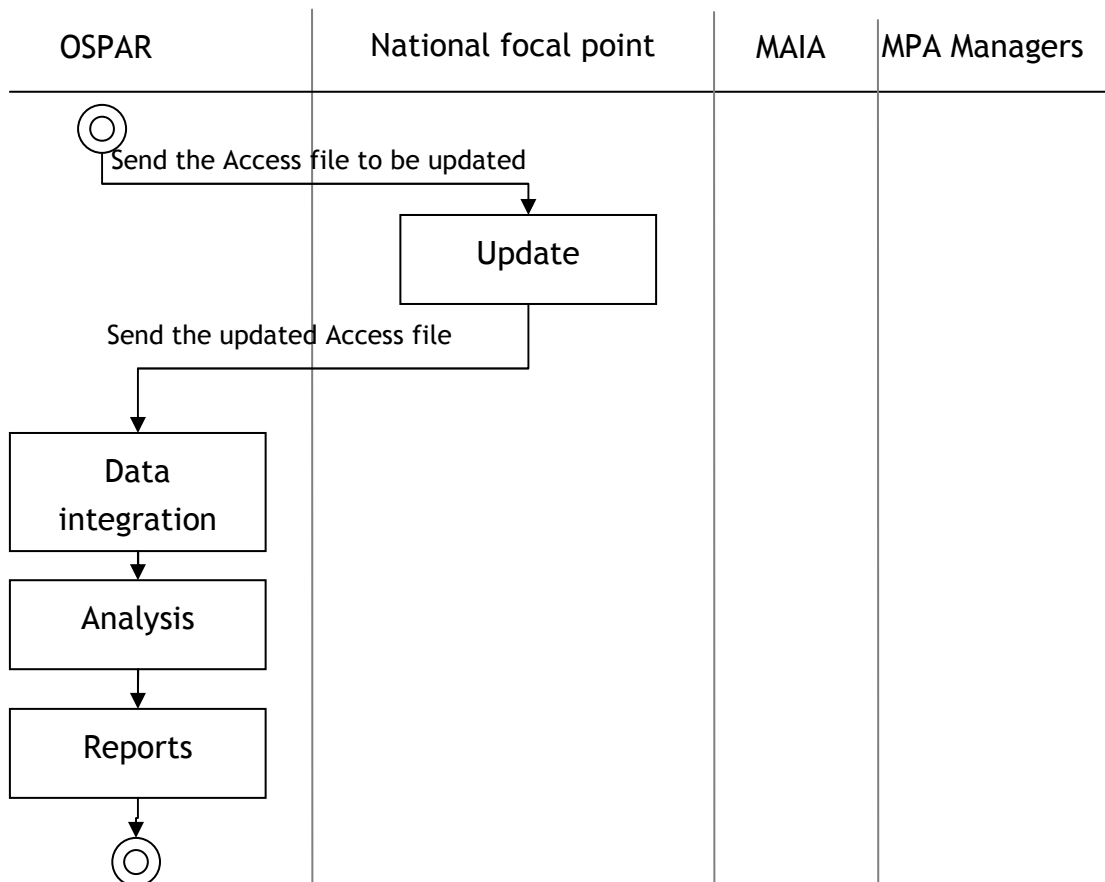
Figure: OSPAR database use and populating

The MAIA stakeholders and managers are not involved in this process.

The participation of the national focal points in terms of providing and updating data is currently very variable (low).

MAIA database populating

The current process used to populate the MAIA database must be distinguished from the target process, due to be introduced in the medium term.

The data collected to populate the MAIA database can be divided into two categories:

- 'Standard' data:
    - o This is the minimum MPA descriptive data, defined by the WCMC.
- 'Management' data:
    - o This is data concerning the management of marine protected areas. This data is the main specificity of the MAIA database.

Current process

Each year, the MAIA team contacts all marine protected area stakeholders:

- The national focal points;
- The OSPAR secretariat for marine areas beyond national jurisdiction (ABNJ);
- Managers of MPAs in the Atlantic arc countries (via the national focal points).

Each stakeholder provides its data:

- Using the online capture tool available on the website for the management data;
- By sending spatial data files (Shapefile - SHP) for the Standard data.
    o The SHP file template is sent by the MAIA team

The MAIA team integrates the Standard data into the MAIA database.

Management data is directly updated in the MAIA database. The management data entered by the managers must be validated by the national focal point before being published on the website.

OSPAR	National focal point	MAIA	MPA managers

Ask (MAIA) for Standard data (file) and Management data (on line)

Ask for Management data

Update the Standard data for ABNJ (pattern file provided)

Update the Standard data (pattern file provided)

Update the Management data (online)

Update the Management data (online)

Validation

Send back the Standard data (file)

Standard data integration

Figure: MAIA database use and populating

MAIA portal target process

The target process automates the collection of standard data by using standardized WFS Web services (Web Feature Service).

The management data continues to be collected via an online entry tool.

This process was defined at the outset in the MAIA portal specifications. However, for the sake of convenience, particularly with regard to the ways the national focal points work, it was considered more appropriate to integrate this process in the medium term. At the time of writing this report, the automatic/dynamic collection process should be operational in the months to come.

This target organization implies that the national focal points and the OSPAR secretariat:

- Update the standard data;
- Provide operational WFS Web services for the collection of standard data.
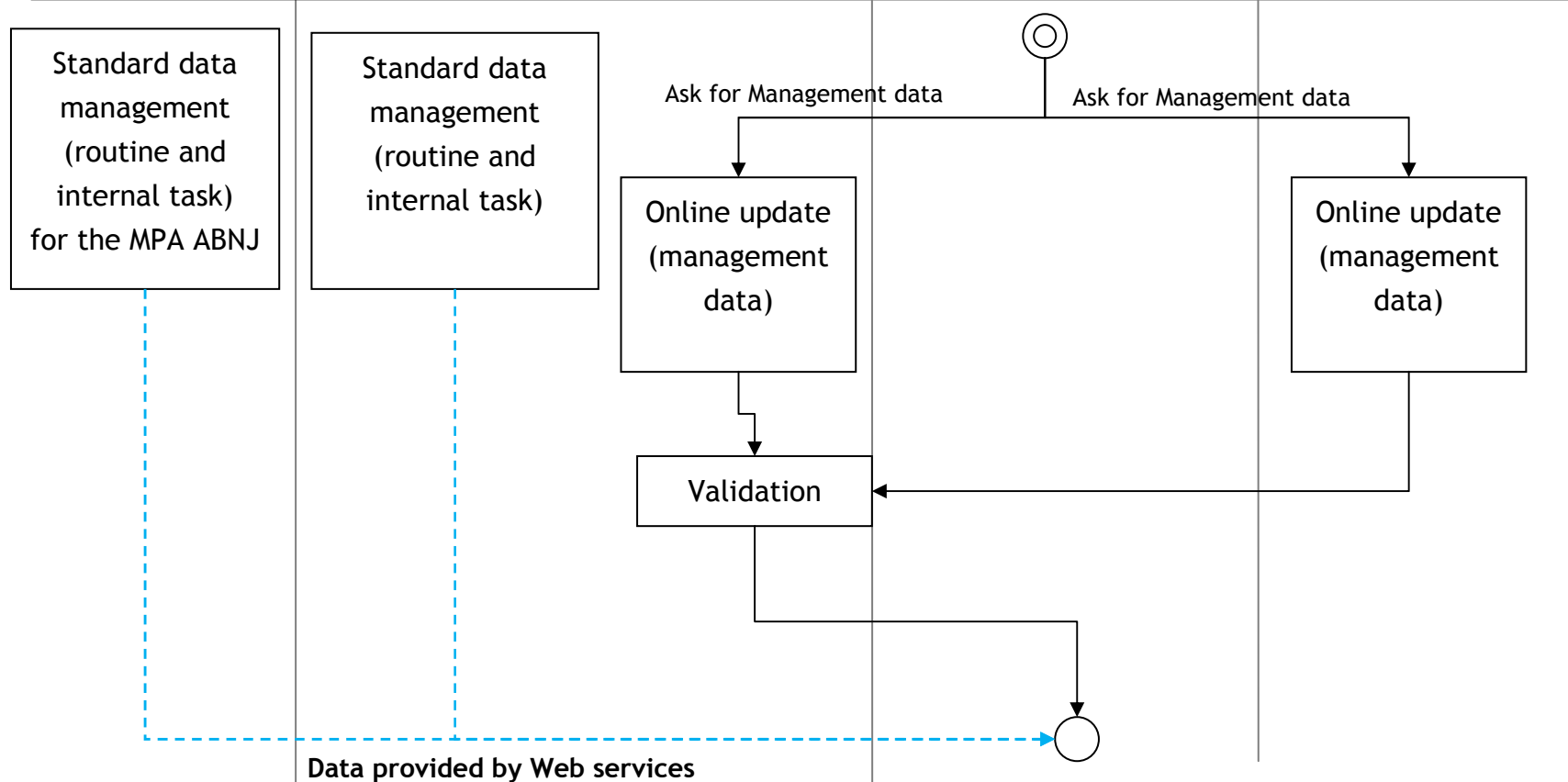
Target data collection and updating process

3.4 Summary and comments

Criteria	OSPAR	MAIA
Technical	The OSPAR database is a single-user product and requires a commercial MS Access licence. The data format is proprietary.	Centralized on a server, MAIA data can be used in Web mode. The technologies used are open. The system is compatible with OGC standards.
Uses	The OSPAR database meets a need for structured data storage. Collection processes are not optimized.	The MAIA application seeks to be a real tool shared by a community of identified stakeholders, where data can be viewed and updated. There are plans to automate the updates (Web Service).
Functions	The range of functions is minimal: update and queries. Spatial data is not included.	MAIA offers a wide range of functions in line with user needs and particularly a dynamic map and user-configurable query functions. The site includes data export tools (alphanumeric and vector data).
Organization	The participation of national focal points varies greatly. The updating process is not industrialized. It requires 'tailor-made' processing	The current process is partly based on file transmission (data duplication), but also relies on online data entry tools. Eventually, the target

every time a database is delivered by a national focal point. These operations can be time-consuming and a source of errors. The current organization implies duplications of data.	updating process will be automated: online capture and Web services. However, additional technical skills will be necessary which implies that the stakeholders provide financial and human resources to invest in tools, particularly for the production of OGC Web services.

In addition to its content, the approach of the MAIA database meets needs in terms of:

- Data centralization
- Access (consultation, update) to data in Web mode
- Data collection automation

Organization

The good technical and functional standard of the MAIA database is particularly due to the existence of dedicated human resources and appropriate funding. It is clear, as even the manager admits, that the OSPAR database is managed with very limited resources. The dynamic data capture in the MAIA base is good for users, as data capture results can be viewed in real time. This is not the case with the OSPAR database which, with the current updating process, demands a certain length of time before the captured data can be used.

3.5   Content comparison

This section has been drafted by the AAMP.

Methodology

First, all the fields of the two bases were listed. Then, for each field, the following items are specified:

- The information capture mode (free entry, predefined list, etc.),
- The type,
- The field format for the user (front),

- The field input help (definition).

Further details or questions can be added in a "comments" column.

To make the most accurate comparison of the database contents, field definition and capture modes provide valuable help. The OSPAR database only occasionally provides data capture help messages.

The levels of correspondence proposed by the AAMP are based on:

- Knowledge of the requirements of the OSPAR Convention as regards MPA reporting by the AAMP team
- Help available in the OSPAR MPA Access database.

A review/validation of the correspondences proposed should be done by the ICG_MPA.

Definition of the correspondence levels used in the analysis grids

For each field-to-field comparison, one of the following six values has been assigned:

- "Conform": the two fields match.
- "To be confirmed": the fields match in principle, but this needs confirming.
- "Adaptable": a simple adaptation of the data collected will make the two fields conform.
- "Query": the information is available via a query (generally geographic).
- "Partially conform": the fields match partly.
- "No equivalent": the fields are not equivalent.

Except for "no equivalent", the fields can be made compatible in all the other categories (with varying degrees of effort).

Four objects have been studied:

- The MAIA database (Postgre SQL - Post GIS),
- The OSPAR database (Access)
- The OSPAR *effectiveness of management scorecard* document
- The INSPIRE data model for protected sites

Table I: Characteristics of the objects studied

DATABASE/ OBJECT	SOURCE	NUMBER OF FIELDS / INFORMATION	OBSERVATION
MAIA	Database conceptual model	77	Note that the number of fields between the MAIA and OSPAR databases is similar but the OSPAR fields frequently cover redundant information.
OSPAR	Access File	86	
OSPAR "*effectiveness of management scorecard[1]*"	Word Document	78	OSPAR *effectiveness of management scorecard* is not a database but a guide for the assessment of MPA management. Where items were similar, they have been grouped together.
INSPIRE[2]	JRC Specification	39	

Note

The disparity of the objects studied prevents a strict field-to-field comparison; comparisons are mainly based on the information contained in the field.

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[1] Guidance to assess the effectiveness of management of OSPAR MPAs: a self-assessment scorecard

[2] D2.8.I.9 INSPIRE Data Specification on Protected sites – Guidelines

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The following comparisons are done:

- OSPAR DB with MAIA DB
    - OSPAR fields are associated with all the MAIA database fields
- MAIA DB with OSPAR DB
    - MAIA fields are associated with all the OSPAR database fields
- MAIA DB with the "effectiveness of management scorecard"
    - MAIA fields are associated with all the OSPAR "*effectiveness of management scorecard*" fields
- MAIA with INSPIRE
    - MAIA fields are associated with all the INSPIRE fields

Note:

The objects covered differ in the number of fields. This therefore impacts the ratios of overlap. The percentages obtained must thus be read in the light of this factor. **The values stated are relative, not absolute.**

Data families

Five data families can be identified in each of the databases. However, this does not necessarily mean that the data is **strictly** equivalent.

- Standard: data describing the MPA complying more or less with international or European standards
- Management: factual data to assess whether a site is effectively managed (indicators of effective MPA management)
- Management effectiveness: usually "perceptive"-type data on assessment of the effectiveness of the site management (achievement of conservation objectives, etc.)
- Status: data relative to the conservation status of the site
- Habitats and Species: data describing the presence of habitats and species under protection status on the site

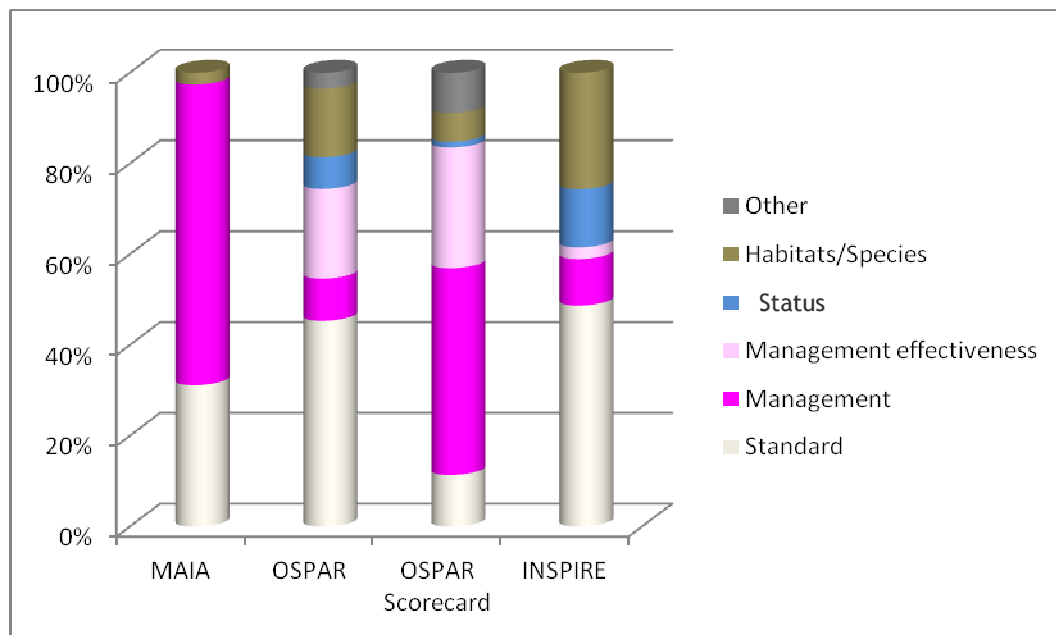**_Summary of the distribution of data families in the objects studied_**

Figure 1: Distribution of data families by object studied

This document shows the initial focus given to each of the four entities studied:

- For the MAIA database, a core set of standard data and a set of factual data concerning site management, from which an assessment can subsequently be done;
- For the OSPAR database, a significant number of standard data (partly due to redundancy of information), the aim of focusing on management assessment and a substantial amount concerning MPA "content" (characteristics for the designation and habitats and species);
- The scorecard naturally focuses on management and the assessment thereof, but does not rule out the need for standard information;
- Lastly, the INSPIRE Directive naturally tends towards standard data and the rest mostly focuses on information about habitats and species.

These four entities have a lot of standard information in common, which is a potential advantage for their compatibility as we will see later. Shared management information is also a positive factor for the pooling of certain databases (objects).

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Results

The results presented below only concern two of the comparisons done:

- Comparison of the MAIA GIS DB with the OSPAR DB (MAIA fields are associated with all fields in the OSPAR database)
- Comparison of the MAIA GIS DB with the OSPAR management effectiveness assessment scorecard (MAIA fields are associated with all the "fields" in the OSPAR effectiveness of management scorecard)

The other results are available in the full content comparison document appended.

Comparison of the MAIA GIS DB and the OSPAR DB

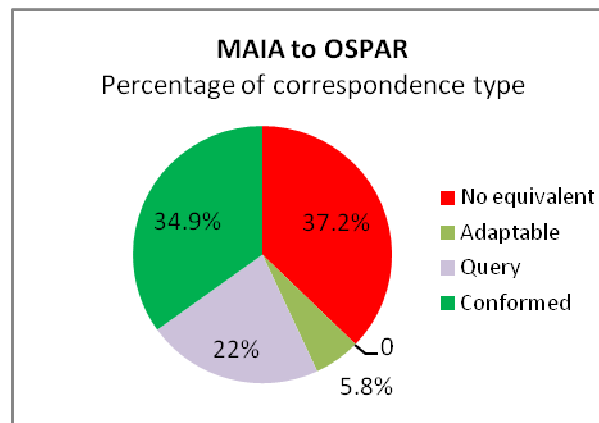MAIA fields are associated with all the OSPAR database fields.

Figure 2: Distribution of correspondence between the MAIA database fields and those of the OSPAR base

When the contents of the MAIA database are compared with the OSPAR base, the match rate is **63%** ("Conform" / "Adaptable" / "Queryable" fields).

Table II: Percentage of field overlap by data family (MAIA fields are associated with all the OSPAR database fields)

Data family and correspondence type	Number of common fields	Percentage of common fields	
Standard_No equivalent	3	8%	
Standard_Query	18	46%	**92%**
Standard_Conform	18	46%	
Management_No equivalent	2	25%	
Management_Adaptable	5	63%	**75%**
Management_Conform	1	13%	
Management effectiveness_No equivalent	17	100%	
Status_No equivalent	6	100%	
HabitatSpecies_No Equivalent	1	8%	
HabitatSpecies_Query	1	8%	**92%**
HabitatSpecies_Conform	11	85%	
Other_No equivalent	3	100%	

The OSPAR database shares 92% of its standard fields with the MAIA database, **75% of its management fields** and 92% of its fields relating to habitats and species under protection status. However, no field on the assessment of management effectiveness is shared with the MAIA database.

Comparison of the MAIA GIS DB with the OSPAR Effectiveness of Management scorecard assessment

MAIA fields are associated with all the fields of the OSPAR effectiveness of management scorecard document
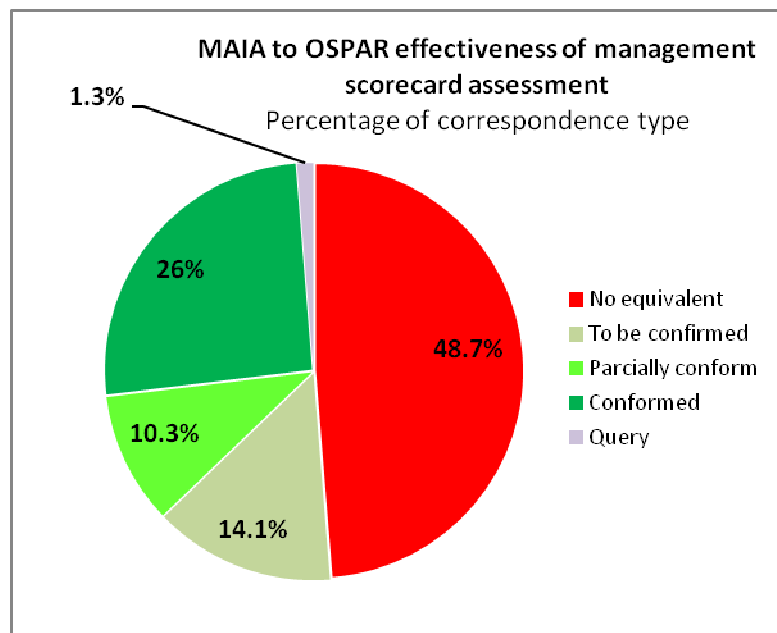

Figure 3: Distribution of correspondence between the OSPAR effectiveness of management scorecard document fields and those of the MAIA database

The comparison of the MAIA fields with the information necessary to assess **the effectiveness of MPA management shows a 51% match (information that is "conform", "partially conform", or "queryable").**

Table III: Percentage of field overlap by data family (MAIA fields are associated with all the fields of the OSPAR management effectiveness scorecard)

Data family and correspondence type	Number of common fields	Percentage of common fields	
Standard_No equivalent	2	22%	
Standard_Query	1	11%	**78%**
Standard_Conform	6	67%	
Management_No equivalent	8	22%	
Management_Adaptable	1	3%	
Management_ToBeConfirmed	6	17%	**78%**
Management_PartiallyConform	8	22%	
Management_Conform	13	36%	
Management effectiveness_No equivalent	20	95%	
Management effectiveness_ToBeConfirmed	1	5%	
Status_No equivalent	1		
HabitatSpecies_ToBeConfirmed	4	80%	100%
HabitatSpecies_Conform	1	20%	

The comparison of the MAIA fields with the information collected in the OSPAR *effectiveness of management scorecard* document shows that **78% of the standard fields and <u>management fields</u> are shared as well as 100% of the fields relating to habitats and species under protection status.**

<u>Summary and proposals</u>

Convergence is high as regards the standard fields between the four databases. All the databases have a minimum of basic fields describing the MPA (name/surface area/designation).

For the other data themes, the situation is more divergent as the goals of each database differ. Nonetheless, **for the 'management' theme in particular, the match rate is good between the MAIA database, the OSPAR management**

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effectiveness scorecard and the OSPAR Access database (even though the latter only includes few management fields).

Only the MAIA and INSPIRE databases include geographical data of protected areas.

It is important that the OSPAR base be aligned with the European and international data models with regard to the Standard data and include the geographical aspect of protected areas.

In the light of the goals of the OSPAR Convention as regards marine protected areas and the need to monitor/assess effective management of these MPAs, it would be appropriate to pool the contents of the MAIA and OSPAR databases (Access DB and scorecard) and possibly share them in full. Given the matches detected, the necessary convergence effort would be relatively limited. The development of a common data model between MAIA and OSPAR is feasible without completely overhauling the existing databases.

Assessment of management effectiveness is a common concern (institutions and stakeholders), but this necessary assessment is still difficult to implement in an operational manner. The perception parameters currently used the most for this assessment are not always satisfactory for objective analyses.

A first step involving a standardised and joint assessment of **effective MPA management** at OSPAR level would probably be a first basis for consideration and evaluation as regards the MPA network development. This is the goal pursued by the MAIA database which, for the time being, includes factual management information, and plans to subsequently assess it, but not necessarily within the database.

Work on the **assessment of management effectiveness having regard for MPA goals** using common indicators and metrics across the Atlantic arc could be a future project.

Whatever decision is made (level of pooling), the objectives of the new database must be clearly defined and approved by the stakeholders upstream.

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4.1 Recap on interviews

The table below sums up the interviews based on the following key points:

- MAIA and OSPAR databases
- WDPA and N2000 identifiers of marine protected areas

4.2 List of people contacted

Name	Affiliation
DR. HENNING VON NORDHEIM	BFN, GERMANY (OSPAR ICG-MPA)
TIM PACKEISER*	WWF GERMANY (former OSPAR ICG-MPA)
LAURENT GERMAIN*	AAMP - FR
JENNY OATES*	JNCC - UK
LAURA PIRIZ	SWEDEN MINISTRY SWEDISH AGENCY FOR MARINE
LENA TINGSTRÖM	AND WATER MANAGEMENT
MARIA KILNÄS	COUNTY ADMINISTRATION ON THE WEST COAST OF SWEDEN
SESSELJA BJARNADOTTIR	ICELAND MINISTRY OF ENVIRONMENT
FERNANDO TEMPERA	PORTUGAL
INMACULADA GONZÁLEZ	SPAIN
CHRISTIAN NICOLAJ LINDEBORGH	DENMARK MINISTRY
BRIAN MC SHARRY	ETC CDDA
MINNA PYHÄLÄ	HELCOM CONVENTION
MARIA LAAMANEN	HELCOM CONVENTION

The shading indicates the people who were interviewed. Emails were exchanged with Dr. von Nordheim.

Committee meeting held at the start of the project

Laurent GERMAIN	AAMP
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Tools and databases			Identifiers		Observations
MAIA	**OSPAR**	**Other**	**WDPA**	**N2000**	
Ms KILNÄS - *County Administrative Board of Västra Götaland / Department of Nature Conservation - SWEDEN*					
Not known	Not known	• Skyddad natur • Vic Natur • Natura 2000 • See Meets Land (2013)	Not used	Used	MAIA data does not cover Sweden. The MAIA tool seems to offer some interesting functions (in particular data export). The geographical aspect is essential. It is essential to share data about MPAs. WDPA data update by the WCMC is unpredictable.

MAIA	OSPAR	Other	WDPA	N2000	
Mr. Mac SHARRY - *ETC/DB – EU / EEA*					
Known	Known	CDDA (Common Database on Protected Areas for Europe - EEA)	Used (CDDA)	Used	Most of the CDDA is used internally. The MAIA database is still recent and should experience growing use. Use of the OSPAR database is on the decline due to the absence of geographical data. The entity is responsible for the CDDA. For now, the WDPA code is the rule but will have to coexist with the INSPIRE code in future.
Mr. Tempera - *UAC - Portugal*					
MAIA data supplier	OSPAR data supplier	Not mentioned	Used	Used	Good use of data can be made owing to the MAIA database structure (list of values, etc.).
Ms LAAMANEN - *HELsinki CoMmission (HELCOM) - Finland*					
Not known	Not known	• Baltic Sea Protected Areas database	Not known	Used (HELCOM)	The entity has tools suited to its missions

		• HELCOM Database			
Ms OATES – *JNCC – Unit Kingdom*					
Data supplier and user	Data supplier only.	• Panache (2013) • Internal database being studied	Used if necessary	Not specified	The MAIA database only covers the west part of the JNCC's area of jurisdiction. The structure of the MAIA database restricts free input of information (comments fields, etc.). The WDPA code is used for international projects.
Christian Nicolaj LINDEBORGH - *Danish Ministry of Environment – Nature Agency*					
Not known	Not known	• EUSeaMap (transnational project, led by JNCC)	Not specified	Used (via HELCOM)	Informal procedures between regional partners. Creation of regional databases is an ambitious plan, given the significant differences between players (needs, regulations, definition, etc.).

4.3   Analysis of interviews

On the whole, interviewees know of the OSPAR database.

Interviewees only partly know of the MAIA database for two reasons:

- its recent launch (December 2011)
- geographical coverage focused on the west of the OSPAR area

Many other national or regional databases on topics (scopes, description of habitats, wildlife, etc.) related to OSPAR and MAIA exist or are in the pipeline. The MAIA database stands out by the integration of MPA management-related data.

The geographical component of MPA data is very important. The absence of geographical data is given as a reason for ceasing to use a tool.

People working with MAIA and OSPAR note that content is similar and complementary between the two databases.

Due to its structure, the MAIA database offers advanced analysis and search capabilities but on the other hand, is limited in terms of adding comments and observations.

While most entities know of the WDPA identifier, its use is limited and is most often done in response to supranational demands. For national topics, entities apparently develop internal identifiers. Problems with identifier updating by the responsible entity (WCMC) are reported. The WDPA identifier creation procedures restrict dissemination.

The N2000 code is more widely known and used.

4.4   Recap on needs expressed

The interviewees confirm the importance of the geographical component on marine protected areas.

It is vital to share information between players, in particular between two countries. Therefore, the various existing tools (HELCOM, MAIA, EUSeaMaps, OSPAR MPA DB, CDDA and WDPA, etc.) must at the least make such sharing possible, which is not true of all the tools to date.

The need for MAIA and OSPAR database convergence is mentioned by the great majority of interviewees.

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The addition of complementary information in a future combined database (MAIA – OSPAR) is mentioned in particular for the following themes:

- EUNIS Habitat / Information
- History of MPAs
- Biotopes

5.1 Presentation

The interviews conducted as part of the comparative study of the databases and the regulatory context identified the following points:

- Importance of the spatial component of MPAs
- Data networking (INSPIRE context)
- Importance of national focal points in the missions of MAIA and OSPAR
- Definition of unique identifiers shared by all users
- Content

5.2 Importance of the spatial component of MPAs

Users confirmed the importance of the spatial component of MPAs in their profession. A database on MPAs must integrate this geographical dimension.

5.3 Networking: INSPIRE context

Reflection done on the changes to the MAIA and OSPAR databases must take into account the current organizational, technical and regulatory changes at European level.

- Today, true networking is possible with Web technology. Data is accessible and the level of interoperability is growing. This is also true of geographical data (OGC standards).
- Entities are integrating these technical changes, which is reflected by the multiplication of map Web sites.
- The INSPIRE Directive not only drives but also embodies this networking process.

Networking requires the participating entities to be technically capable of fitting into the network and rethinking their organization.

INSPIRE Network

The deployment of INSPIRE should enable MAIA and OSPAR to directly use the data produced via Web services by the responsible entities, via the focal points. MAIA and OSPAR will then be able to focus on their areas of expertise and thus restrict the duplication of data.

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Remember that the implementation of the INSPIRE Directive by the Member States and entities involved is a long process with considerable disparity in the state of progress. In the case of MPAs outside the European Union, OSPAR is supposed to do the acquisition of such data. MAIA may integrate this data without any specific official requirements.

Ideal implementation in the MAIA / OSPAR context

The national focal points fully satisfy the INSPIRE Directive. In particular, they provide the services of co-viewing and downloading data on marine protected areas, in line with the INSPIRE full data model. They update the information requested under INSPIRE.

As they have data describing marine protected areas, MAIA and OSPAR focus on their respective themes:

- ABNJ data for OSPAR
- 'Management' data (information relating to the effective implementation of management) for MAIA, within the limits of operational contacts that can be established with all the managers within the OSPAR region

MAIA and OSPAR may pool their common data so as to reduce duplications. MAIA and OSPAR exchange data through Web services.

MAIA and OSPAR are positioned as aggregators of external flows, coming from the national focal points, to which they add their own theme-based information.

The "ideal" future target organisation can be represented as follows:
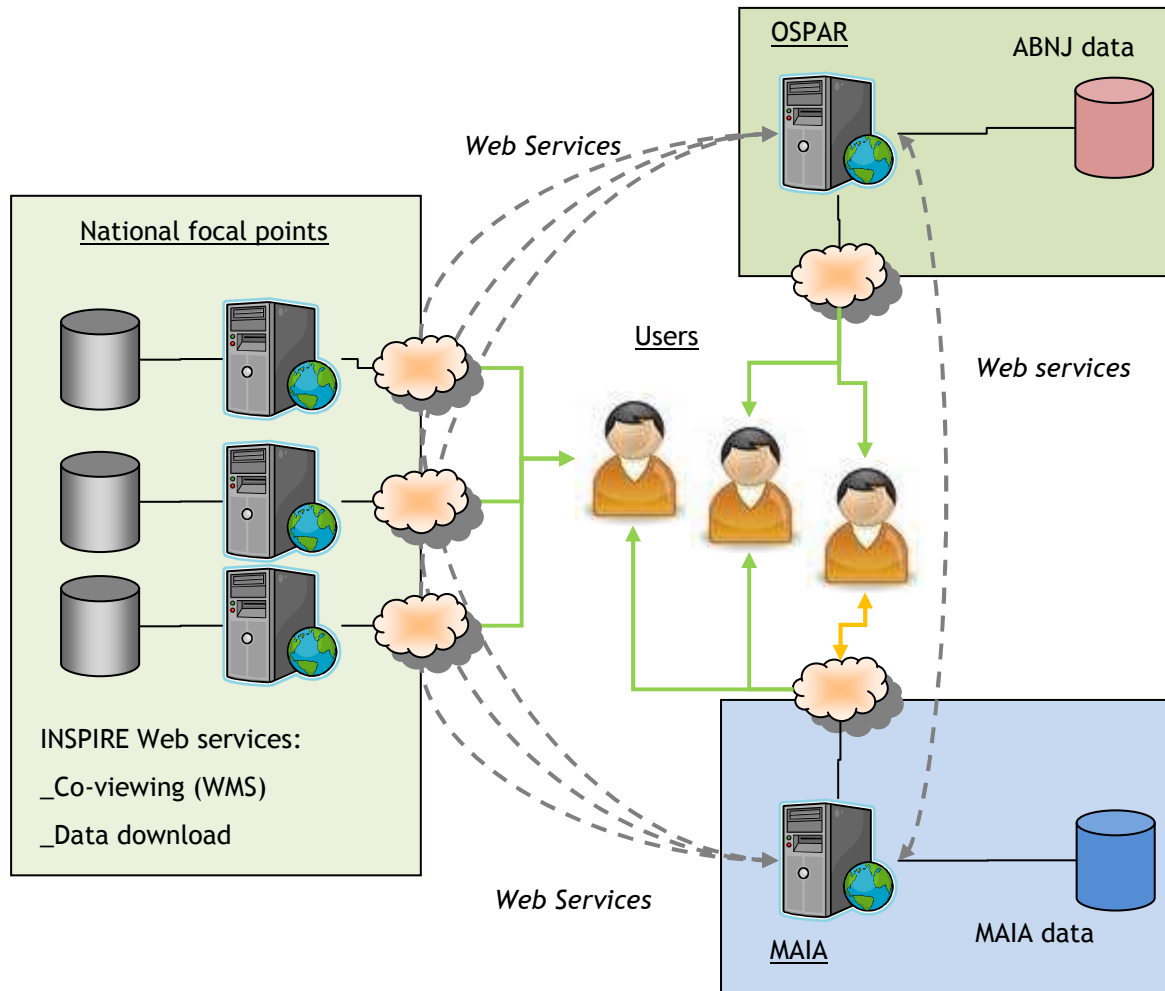
The OSPAR secretariat has a tool combining:

- The ABNJ data managed and stored internally (OSPAR).
    - Online input function is possible
- The data managed by the Member States and accessible via Web services as part of INSPIRE
- The MAIA (management) data accessible via Web services

The MAIA team has a tool combining:

- The MAIA (management) data managed and stored internally
    - Online management data input function
- ABNJ data managed by OSPAR and accessible via Web services
- The data managed by the Member States and accessible via Web services as part of INSPIRE (with a focus on data from EU Member States and possibly data acquired outside the EU)

MAIA already has the technical infrastructure (portal) enabling it to be a part of this target organization.

Observations

The implementation of the target organization described above hinges on three major conditions:

- Widespread use of the INSPIRE full data model by the responsible entities
- Unique identifiers accepted by all the players
- Involvement of all the responsible entities (national focal points)

Objectively, it would appear that these three conditions will not be met in the short term, despite the official schedule of the INSPIRE Directive. Like any European directive, the latter includes coercive constraints, but it is yet to be seen whether this will be sufficient for the various national entities involved to swiftly meet the requirements.

5.4   Involvement of national focal points

MAIA and OSPAR are directly dependent on the involvement and work provided by the national focal points. Data relating to MPAs, in areas under national jurisdiction, come from the Member States.

5.5   MPA identifiers

There are six identifier systems relating to marine protected areas in Europe.

Identifier	Coverage	Observation
OSPAR	North-East Atlantic	Object beyond national jurisdiction *Note: Also create IDs for objects located in waters under national jurisdiction*
N2K	EU	EU
INSPIRE	EU	EU
CDDA	EU	Managed by the EEA (EU)
WDPA	World	Managed by WCMC

National	Country	National management

Up to six identifiers may apply to a same marine protected area depending on the entities involved.

Example

Parc naturel marin – Iroise

INPN/MNHN: FR9100001

CDDA: 388659

WDPA: 388659

OSPAR: 0FR0009

Réserve naturelle nationale - Baie de Saint-Brieuc

INPN/MNHN: FR3600140

CDDA: 178260

WDPA: 178260

OSPAR: 0FR5300066

5.6   Content

The study of contents shows that the information contained in the MAIA and OSPAR databases is very similar.

Two options are possible:

- Converge the two databases into one
- Keep the two existing databases with their specific contents.

6.1   Presentation

Why the OSPAR database must evolve

The technical features of the OSPAR database and its updating processes have obvious limitations.

The integration of the OSPAR database into the environment being developed means it must drop the file-based approach and turn towards Web technology and interoperability. Integration of the geographical component is also considered essential.

Note

The MAIA database meets the current technical specifications (Web, interoperability, Web services, etc.).

Proposals

The proposed changes are based on two parameters:

- The content of the MAIA and OSPAR databases
    - Common content (MAIA/OSPAR common data model on management data)
    - Different content
- Technical implementation of the infrastructure
    - Pooled infrastructure
    - Separate infrastructures

Four suggested changes are thus possible:

Implementation technique / Database content	Pooled	Separate
Common	A	B
Different	C	D

These proposals are based on the following common hypotheses:

- OSPAR database and management tools in Web mode
- Management of Standard data by the national focal points
  - Standard data is supplied via Web services (optimistic hypothesis) or by online capture (cf. MAIA at present).

## 6.2   Proposal A: pooled system and common data

Presentation

OSPAR and MAIA use the same technical infrastructure to provide users with a tool to:

- consult alphanumeric and map data, and documents
- update alphanumeric and map data for which MAIA and OSPAR are responsible.

The MAIA and OSPAR front ends are developed specifically for each entity. They enable users to identify the two entities.

Data is common between MAIA and OSPAR and divides into three categories:

- OSPAR ABNJ data for which OSPAR is solely responsible
- Management data placed under the joint responsibility of MAIA/OSPAR
- 'Standard' data:
    - collected from the national focal points via Web services (ideal case)
    - or updated online (like MAIA at present).

MAIA User

MAIA

OSPAR

OSPAR User

Management Data

OSPAR ABNJ Data

Standard Data

Web services of the focal points
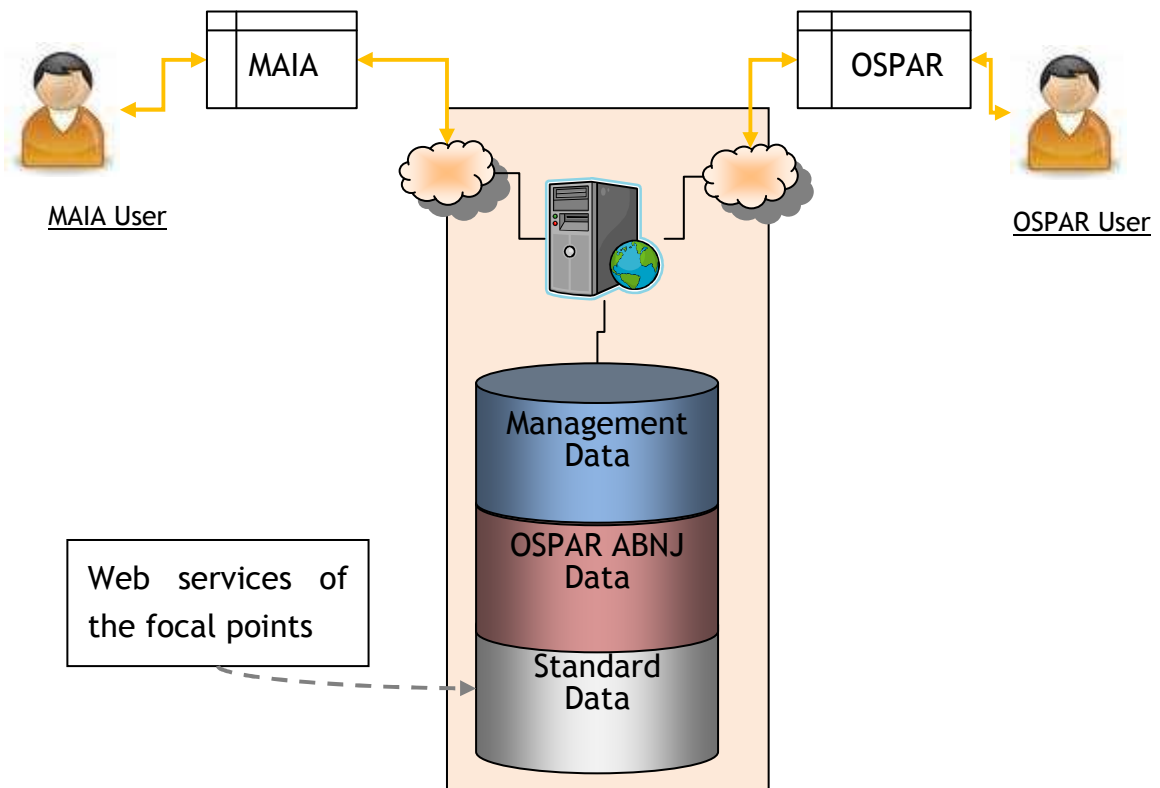
SWOT analysis

	Technical	Project
Strengths	Technical cohesion Swift technical implementation (if the MAIA technical structures are used) Harmonized input by the national focal points	Sharing of costs
Weaknesses	Dependence on national focal points	Financing Period of approval by stakeholders
Opportunities	Centralization of data relating to MPAs in the North-East Atlantic Reference database	
Risks	Convergence of databases and needs Loss of the specific features of each entity	Organization/administration of the tool management in the long term Long-term financing

Comments

This proposal is technically and functionally coherent.

It requires the approval of all the stakeholders. There is a real risk of seeing the specific features of each entity disappear.

Technically, it can be implemented swiftly if the decision to extend the MAIA infrastructure to OSPAR is made. A specification step is nonetheless essential to make the two databases converge and adapt the tools accordingly.

Content convergence and validation by the stakeholders will be the longest phase.

6.3 Proposal B: network system and common data structure

Presentation

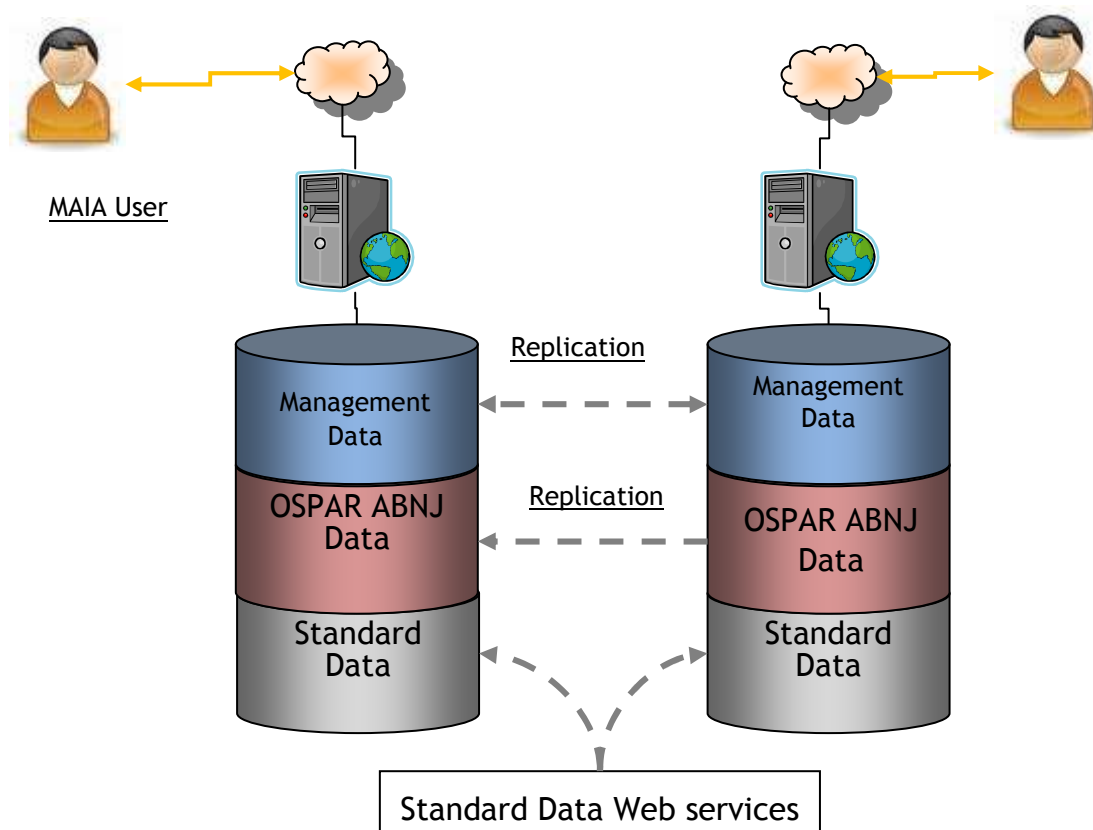OSPAR and MAIA implement their own independent solution to:

- consult data
- update the data for which the entity is responsible.

The two systems are populated with 'Standard' data via Web services from the national focal points.

The two systems use similar but physically separate databases. Replication services are used to synchronize the content of each database. The two databases thus offer the same content.

SWOT analysis

	Technical	Project
Strengths	Entities act independently on their tool	
Weaknesses	Database replication operations Dependence on national focal points Time required for technical implementation by OSPAR	No sharing of costs Financing Period of approval by stakeholders
Opportunities		
Risks	Convergence of databases and needs Content drift due to technical database replication problems.	Joint management of the tools Long-term OSPAR and MAIA financing

Comments

This proposal maximizes the two entities' autonomy as it allows them to have their own tool. The only requirement is to use the same database structures.

The replication operations may be technically sensitive and generate significant risks of desynchronization.

## 6.4   Proposal C: pooled system and different data

Presentation

OSPAR and MAIA use the same technical infrastructure to provide users with a tool to:

- consult alphanumeric and map data, and documents
- update some alphanumeric and map data for which MAIA and OSPAR are responsible.

Specific MAIA and OSPAR front ends are developed. They enable users to identify the two entities.

The common database is structured in five spaces:

- OSPAR ABNJ data for which OSPAR is solely responsible
- MAIA specific data for which MAIA is responsible
- OSPAR specific data for which OSPAR is responsible
- Common 'MANAGEMENT' data (who is responsible?)
- Standard data:
    o collected from the national focal points via Web services (ideal case)
    o or updated online (like MAIA at present).
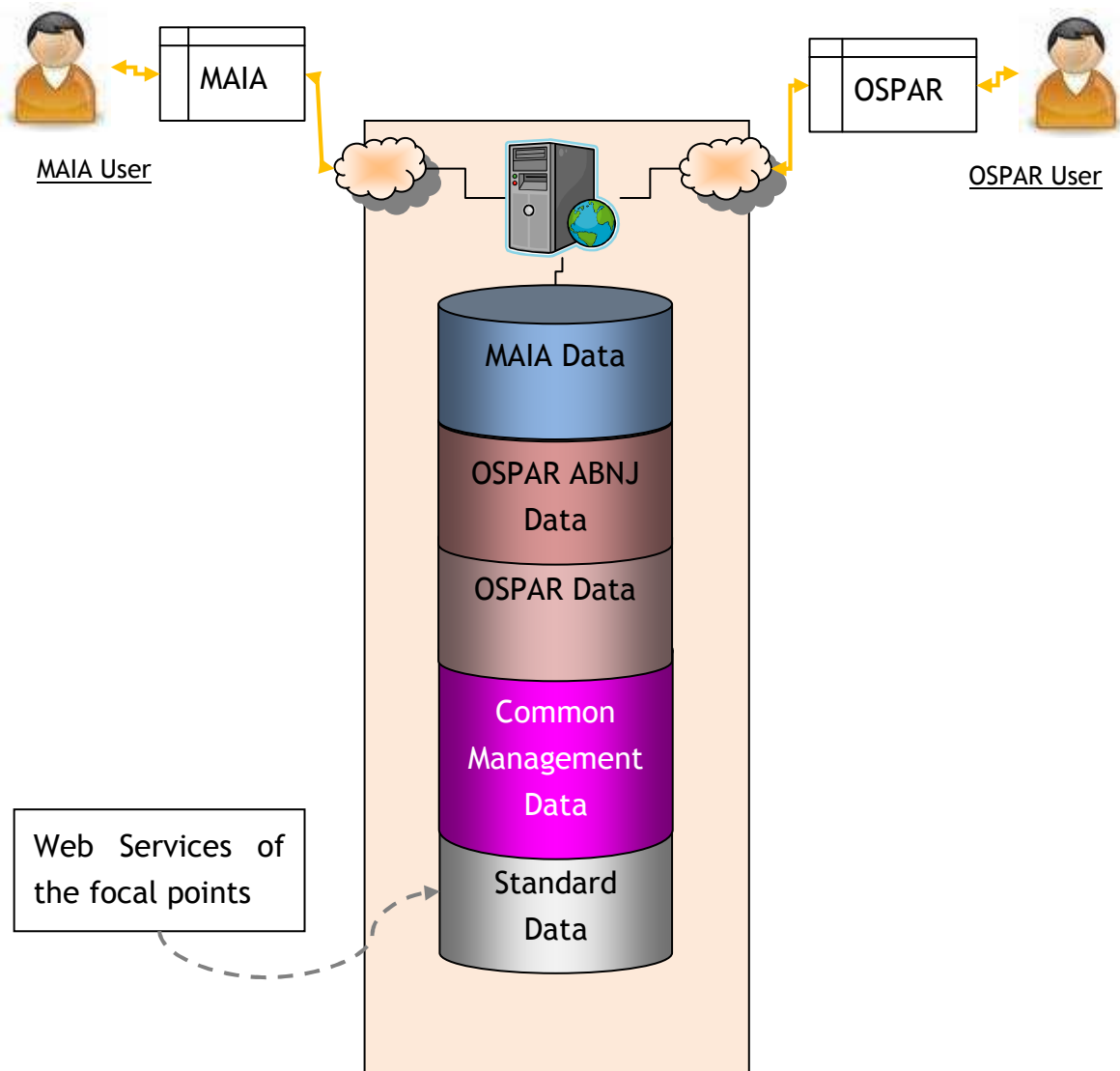
SWOT analysis

	Technical	Project
Strengths	Technical cohesion Technical implementation time (if hosted by MAIA)	Sharing of costs Relative independence of entities (shared data model)
Weaknesses	Dependence on national focal points Inclusion of specific features?	Financing Period of approval by stakeholders
Opportunities	Centralization of data relating to MPAs in the North-East Atlantic Reference database	
Risks	Maintaining the specific features of each entity	Long-term tool management Long-term financing

Comments

Like proposal A, this proposal is coherent from a technical and functional point of view.

The differentiation of MAIA/OSPAR content means respective users are provided with a tool that meets their needs.

Technically, it can be implemented swiftly if the decision to extend the MAIA infrastructure to OSPAR is made. However, this means defining the OSPAR data model and adapting its front ends (forms, etc.)

It requires the approval of all the stakeholders.

6.5 Proposal D: network system and different data

Presentation

OSPAR and MAIA implement their own solution to:

- consult data
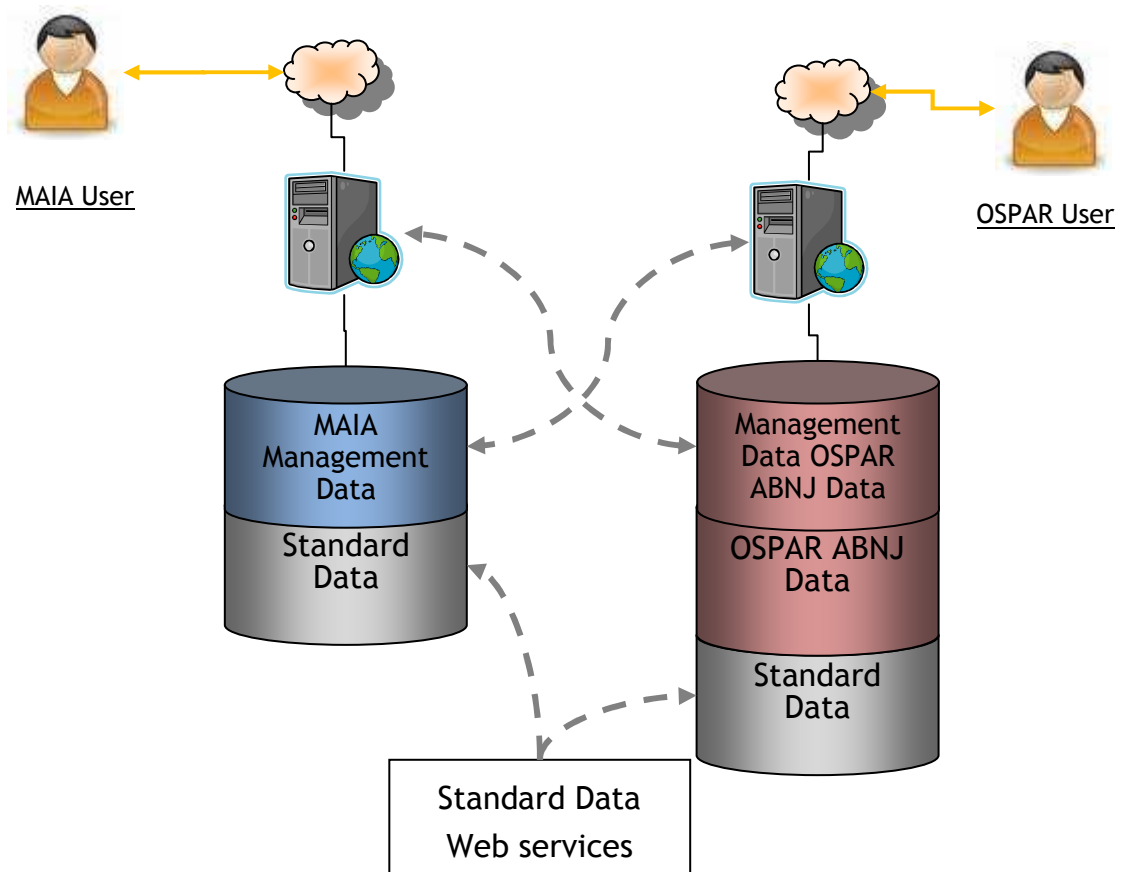- update the data for which the entity is responsible.

Each solution meets the specific needs of the entity in terms of:

- content
  - databases
- functions
- tool management

The two systems are populated with 'Standard' data

- collected from the national focal points via Web services (ideal case)
- or updated online (just like MAIA at present).

The two systems exchange information via standardized Web services.

MAIA User

OSPAR User

MAIA
Management
Data

Standard
Data

Management
Data OSPAR
ABNJ Data

OSPAR ABNJ
Data

Standard
Data

Standard Data
Web services

SWOT analysis	Technical	Project
Strengths	Independence of the entities	Relative independence of entities (data model) Data shared with the users of the entities involved, and uniqueness of information
Weaknesses	Possible duplication of data Dependence on national focal points	No sharing of costs Financing Period of approval by stakeholders Loss of consistency between the two entities
Opportunities	Emulation between the two systems	Management of the tools
Risks	Exchange between the databases (Web services). Drift of the content of the two databases.	Drift of data relating to MPAs in the North-East Atlantic

Comments

With this proposal, the two entities are very independent in the management of their tool.

The only requirement is to provide the third-party entity with usable data services.

MAIA already has an operational tool. OSPAR must develop its tool from scratch.

6.6   Recommendations

Based on the following considerations:

* user wishes for reliable information,
* opportunity of creating a reference database on MPAs across the North-East Atlantic,
* concern to minimize costs,
* possible convergence of MPA management content of the MAIA and OSPAR databases,

the proposals may be classified in descending order of appropriateness:

Classification	Proposal	Description
1	Proposal A	Pooling of the system with a common database
2	Proposal C	Pooling of the system with a different database structure
3	Proposal D	Different systems
4	Proposal B	Systems in a network with a common data structure

Comment

Proposal B was drafted to respect the theoretical potentiality of a solution, but it brings no value or gain.

The key point that could be decisive for a choice between proposals A and C lies in the question of data administration. If the decision-makers wish to favour convergence and financial and functional optimization, proposal A is

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recommended. Otherwise, proposal C is less interesting but represents significant progress compared to the current situation.

6.7   Critical points and decisions to be made

Some other points also demand reflection.

Strategic aspect

As we saw in the chapters above, merging the MAIA and OSPAR databases does not involve any major conceptual difficulty. However, before making any decision, a key aspect must be discussed by the managers and decision-makers: **what is their exact intent for the target system?**

Above and beyond the contents and structures, the current objectives of the two databases differ: MAIA is a "management" database, while OSPAR is an "inventory" database. In an ordinary context of creating or changing an information system, its intended purpose must be defined first, to guarantee optimal design. In principle, multiple functions can be considered, provided this is clearly stated when defining the target system (management system and/or assessment system and/or measurement system, etc.).

Whatever scenario is chosen, our experience has shown that an operational system needs appropriate human and financial resources over the long term, otherwise the use and quality of data gradually deteriorate.

Operational aspect

The current method of administration of the two databases, mentioned several times in this report, is clearly different. In the case of a merged system, the administration resources must converge too. In principle, this decision is purely organizational, and given the international "eco-system" of MPAs, separate administration of a single system will create operating problems.

Next step

The first recommendations made on page 33 mention the importance of reflecting on the assessment of effective MPA management at OSPAR level. This analysis would appear necessary having regard for the needs and assessment information available to date.

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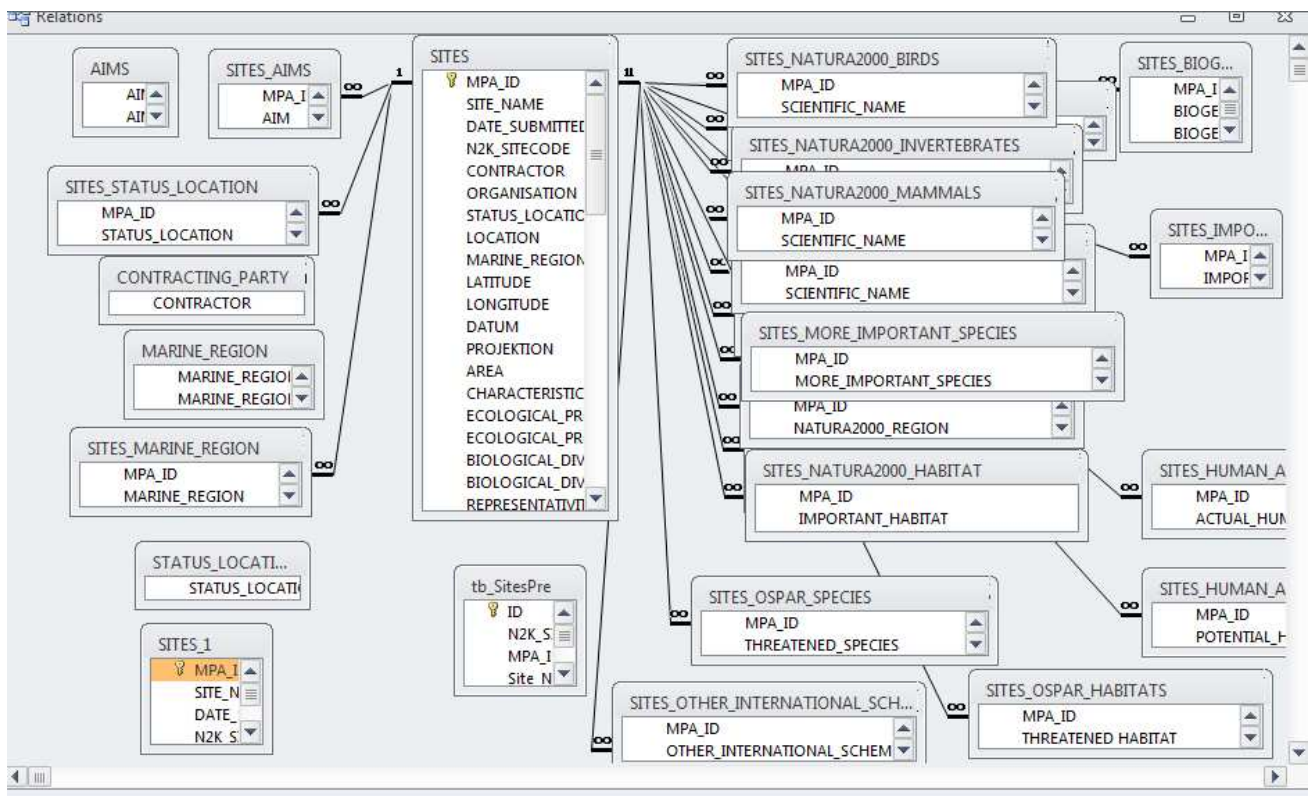## 7.1   INSPIRE simple data model

Document appended.

7.2   INSPIRE full data model

Document appended.

7.3   OSPAR database (CDM)

7.4   MAIA database (Conceptual Data Model)

Document appended.

7.5 MAIA and OSPAR MPA databases comparison study: Components section (AAMP)

Document appended.