Contribution to the concept and implementation of the Biodiversity Data Centre

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Activity 1.3.2

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Date: 10/02/2009

Content

1. Introduction and scope

The European Community and its Member States undertook in 2001 to halt the decline of biodiversity in the EU by 2010 and to restore habitats and natural systems. In May 2006, the European Commission adopted a communication on "Halting Biodiversity Loss by 2010 – and Beyond: Sustaining ecosystem services for human well-being". The Communication underlined the importance of biodiversity protection as a pre-requisite for sustainable development, as well as setting out a detailed EU Biodiversity Action Plan to achieve this. Hence the need for a 'Biodiversity Data Centre' one of a suite of environmental data centres collating, managing and publishing pan-European datasets.

In assessing progress towards the 2010 target there are three primary data types that are required:

- Species, habitats, sites
- Indicators
- Biodiversity Action and Management

The users (or actors) of the Biodiversity Data Centre can be broadly divided into three classes:

- The "Group of Four" (Go4) – the major 'consumer' of the data collated who will be attempting to create a European view of progress, assess whether the action being taken is sufficient and, if not, how it needs to change. These are the European Environment Agency, DG Environment, Eurostat and the Joint Research Centre.
- Member Countries – the main data suppliers but who also have some requirements to access any data collated by the BDC in order to have a context on the status in other MS. For example, if a feature is declining in one state is it also declining in neighbouring states?
- General interest / "informed public" – there is a requirement to provide some level of basic product here, almost certainly through some form of on-line portal.

Development of the BDC will need to be cautious, ensuring that each business area is carefully reviewed in terms of requirements (both users and suppliers) and systems development (both within the immediate partners and beyond). This approach will help ensure that the necessary lessons from previous experience are been learned and that maximum effectiveness is made of other work currently underway.

Another very important strand of work will involve looking at what member states themselves are doing to assess progress towards the 2010 target (and whatever follows it) within their own states and learning the lessons from this process and disseminating this across the other partners.

Finally, it is important to make some reference to the concept of the Biodiversity Information System for Europe (BISE). In principle the only differences between the BDC and BISE relate to:

- The scope of the data holdings, in that the current vision for BISE is much broader than that currently envisaged for the BDC.
- The degree of analysis and interpretation provided on top of the data, where again this function is not an element recognised within the BDC but may well be a major part of BISE

This paper first provides some background on the data centre concept developed by the EEA. It then summarises the main systems and data flows relating to biodiversity data that are already in place across Europe (or under development). Any issues around different themes such as data flow or specific entities such as species, habitats and sites are explored. These issues are then summarised into a set of broader issues which are used to frame the potential areas that the BDC could potentially tackle as initial priorities.

2. The overall framework and objectives

With a view to support the overall biodiversity policy goals a Biodiversity Data Centre (BDC) is being developed by the EEA. This work is carried out under the mandate of the Group of Four - EEA, DG Environment, JRC, Eurostat -, who have committed themselves to develop and implement Environmental Data Centres. The EEA will maintain data centres for five themes (air, climate change, water, biodiversity and land use), Eurostat for three themes (waste, natural resources and integrated product policy) and JRC for two themes (soil and forestry)[1]. This is in order to strengthen their coordination and cooperation regarding the collection and valorisation of data. The Group of Four contributes to the establishment of the data centres and its institutions are the major users of the data and information made available.

2.1 The bodies involved

The European Environmental Agency (EEA)

The mandate of the EEA is

- To help the Community and member countries make informed decisions about improving the environment, integrating environmental considerations into economic policies and moving towards sustainability
- To coordinate the European environment information and observation network (Eionet)

The European Environment Information and Observation Network (EIONET)

The European Environment Information and Observation Network (EIONET)[2] is a partnership network of the European Environment Agency (EEA) and its member and cooperating countries. It consists of the EEA itself, five European Topic Centres (ETCs) and a network of around 900 experts from 39 countries in over 300 national environment agencies and other bodies dealing with environmental information. These are the National Focal Points (NFPs) and the National Reference Centres (NRCs).

The European Topic Centre on Biological Diversity (ETC/BD)

The role of the ETC/BD is to work with EEA member countries and key international organisations to arrive at efficient structures for European data systems in order to

[1] Technical Arrangement between DG ENV, ESTAT, JRC and EEA on Environmental Data Centres (14 November 2005)

[2] http://www.eionet.europa.eu/about

deliver policy-relevant biodiversity data and information. Support and information to enable assessment of biodiversity policy implementation, relate specifically to:

- 2010 biodiversity targets at global, pan-European and European levels
- Birds and Habitats Directives (including Natura 2000)
- Bern Convention (Emerald Network)
- Pan-European Biological and Landscape Diversity Strategy (PEBLDS)
- Regional Marine Conventions

DG Environment

The main role of the European Commission's Environment Directorate-General is to initiate and define new environmental legislation and to ensure that agreed measures are put into practice in the EU Member States.

The information needs of DG Environment feed into the Biodiversity Data Centre at the EEA and also into the development of a Biodiversity Information System for Europe (BISE), developed by DG Environment.

2.2 Environmental Data Centres

According to the EEA's strategy for 2009-2013 the Environmental Data Centres will be further developed in order to assure

- access to relevant data, tools and information services
- synergies with GMES activities
- compatibility with the INSPIRE directive

Within the EEA the particular role of the data centres is related to the role and tasks of the respective Topic Centre of the EEA. Accordingly, the Biodiversity Data Centre is related to the tasks of the European Topic Centre on Biological Diversity (ETC/BD).

The focus of the data centres is on data and information (access, maintenance, integration, quality assurance, quantitative analysis). The role of the Topic Centres can be on these aspects and in addition on assessments and knowledge generation.

Each Data Centre shall:

- Collect, store, maintain, update and make available any kind of data within their thematic area that is necessary for both creating the indicators that have been specified as well as other specified assessments to support EU policies relevant for the European level.
- Collect, store, maintain, update and make available data based on EU reporting obligations (Directives, Systems, SoE voluntary arrangements) and other agreed tasks within the thematic area.
- Provide a link and set up agreements on storage and/or access to data hosted by other data centres / institutions ("foreign" datasets) and create and maintain these data in order to produce a quantitative analysis of the data for the presentation of all indicators at the European level within the thematic area. The assessment will not be part of the responsibility of the EDC.
- Work in close contact with data providers at both the national, European and global level.
- Take an active part in implementing SEIS - the EDC's are the data custodians for their specified thematic area at the European level.
- Use a common European spatial data infrastructure based on the implementation rules set out by the INSPIRE directive.
- Follow the work on e-government to ensure interoperability for environmental data within their theme.
- Follow the development of GMES in order to meet the upcoming *in situ* data requirements for related services.
- Be responsible for the QA/QC procedures at the European level and maintain metadata descriptions both for the data and for the indicators as well as data flowcharts for each indicator relevant for the thematic area.
- Provide and maintain web pages as part of the EEA website and provide links to interoperable web based applications for metadata, discovery, view and download services.

[August2008- On European Data Centres - Common Points and Degrees of Freedom – Proposal for an EEA decision and Environmental Data Centres – Concept & Issues (authors C. Steemans and B. Rondell)]

2.3 The overall objective of the Biodiversity Data Centre (BDC)

The overall objectives of the biodiversity data centre are to meet the needs of the Group of Four. This includes the EU Member States being the main data suppliers, who also have requirements to access biodiversity data and information across national boundaries. In line with EEA objectives, the provision of information on biodiversity for the general public is also part of the objectives. The information provided has to be generated and updated as well as quality controlled in a transparent way.

According to the objectives of the EEA / EIONET strategy 2009-2013 the objective of the BDC is to support

- the delivery of information for decision makers in support of the protection of key species and habitats under the EU directives, the commitment to halt the loss of biodiversity in Europe by 2010 and report on progress and a longer term vision around maintaining the health and resilience of ecosystems.

In more concrete terms this means to

- Provide data on species, habitats, sites and conservation measures to enable assessment of biodiversity policy implementation with a focus on the Nature Directives and the 2010 biodiversity targets.
- Provide information and products (maps, statistic, databases, services, etc.) needed for or resulting from quantitative analysis

3. The current situation

In establishing a Biodiversity Data Centre it should be stressed that we are not starting from scratch. The EEA has available a sound electronic infrastructure and tools for streamlining flows of environmental information in Europe. ReportNet – aims currently to handle about 500 data flows, whereof 80% are periodical in nature. Where online systems exist, both at the national and European level, access through automatic processes resulting in near real time data (e.g. Ozone web, EPRTR). With a view to the recent developments in EU legislation on reporting and data exchange, such as INSPIRE directive and SEIS initiative, the EEA built the Water Information System for Europe (WISE) as a distributed system to facilitate and simplify reporting activities, where the EU legislation became a backbone of the development.

3.1 Existing applications

The existing elements of the EEA's information infrastructure for the topic Biodiversity are described in the Annex. The existing arrangement of these elements is quite complicated and needs to be improved.

The main already existing applications for the BDC are the European Nature Information System (EUNIS) and the Clearing House Mechanism (EC-CHM). The third major element is the Biodiversity Information System (BISE).

The European Nature Information System (EUNIS)

As an output, EUNIS provides data on species, habitats and sites in Europe. Species are an important element of biodiversity at the European scale though extensive mobilisation is not feasible in the medium term. Therefore the focus of the species module in EUNIS is on legislative lists. For Habitats EUNIS provides a comprehensive and hierarchical Habitats classification, including a description of each habitat type. The sites module contains Natura 2000 sites and nationally and internationally designated areas.

The EUNIS web application provides extensive search options, unique features are the association of species, habitats and sites.

The Biodiversity Clearing House Mechanism (EC-CHM)

The EC Biodiversity Clearing House Mechanism of the European Communities (EC-CHM) site is designated as the EC Clearing House Mechanism Focal Point by the European Commission. This site has been established in order to fulfil the obligation of the European Communities being a signatory party to the Convention on Biological Diversity.

The European Portal Toolkit (collaboration software) is freely available to assist Parties in the establishment of their national CHMs. Currently 14 countries use this Toolkit, which is multilingual and supports cooperative work.

The Biodiversity Information System (BISE)

A vision paper describing the role and content of an Information system for Biodiversity in order to support the needs of the European community is currently created by DG Environment. This is a first step towards BISE, the Biodiversity Information System.

The further Development of the BDC will need to be cautious, ensuring that each business area is carefully reviewed in terms of requirements (both users and suppliers) and systems development (both within the immediate partners and beyond). This approach will help ensure that the necessary lessons from previous experience are been learned and that maximum effectiveness is made of other work currently underway.

Another very important strand of work will involve looking at what Countries themselves are doing to assess progress towards the 2010 target (and whatever follows it) within their own states and learning the lessons and disseminating this across the other partners.

The present situation is described and any issues around explained around the main data flows as well as the broad data themes in the following chapters.

3.2 Priority Data flows for the BDC

The most important data flow for the Biodiversity Data Centre is the reporting of the Member States in the context of the (i) Birds and Habitats Directives. Furthermore the sharing of data on (ii) Nationally Designated Areas with Countries is a priority. (iii) SEBI and Core Set indicators present the third important data flow. Together with data taken

from literature or shared with other institutions – on the basis of cooperation agreements - in order to enable assessments these data flows form the core data of the BDC.

(i) Data flow Birds and Habitats Directive

For a complete overview on the data resulting from reporting under the Birds and Habitats Directive see 'Scoping paper on Data flows from the Birds and the Habitats Directives, ETC/BD 2008'. Below, only the data flow for Natura 2000 and Article 17 reporting are described.

The table below describes the data flow for Natura 2000

Area covered	EU member states
Main data items	Data on sites, species and habitats listed in the Annex of HD
Data input	Member States send descriptive data as Microsoft Access Database and spatial data to the "Permanent Representative", who will formally give over the data to the EC. Beginning 2009 the data can be uploaded via ReportNet
Data structure	According to the existing “Standard Data Form” as used in Natura2000 software. The Standard Data Form will be revised in 2009 (see Work package 4 of Expert Group on Reporting)
QA	Automated, using SQL to check basic data integrity, carried out by ETC/BD
QC	Chain from automated to manually, creation of comprehensive reports used to communicate with MS
Data processing	European data set compiled from single MS datasets - descriptive data: merge of MS datasets (ETC/BD) - spatial data: merge of MS datasets (ETC/BD)
Particularities	Data sets contain sensitive data, that have to filtered out according to the use of the data
Update cycle	Ongoing, in average twice the year per MS, depends on the specific situation within the country
Main use	Support to Nature Directives

A detailed description on the data items is given in the Annex. The dataflow for the Nature Directives will be reviewed in 2009.

Description of the data flow for Article 17 reporting

Area covered	EU member states
Main data items	Monitoring data on species and habitats of the Habitats Directive
Data input	Member States upload descriptive data and spatial data via Reportnet (XML-files)
Data structure	According to the agreed format 'Assessment, monitoring and reporting of conservation status – Preparing the 2001-2006 report under Article 17 of the Habitats Directive. Note to the Habitats Committee, DG Environment, Brussels, 15 March 2005' http://circa.europa.eu/Public/irc/env/monnat/library?l=/habitats_reporting/reporting_2001-2007/reporting_framework&vm=detailed&sb=Title
QA	Automated; using SQL to check basic data integrity, carried out by EEA
QC	Chain from automated to manually, creation of comprehensive reports used to communicate with MS
Data processing	European data set compiled from single MS datasets - descriptive data: compilation of data sets for Biogeographic Regions - spatial data: compilation of data set for Biogeographic Regions
Particularities	Data sets contains sensitive data, that have to filtered out according to the use of the data
Update cycle	6 years reporting cycle
Main use	Support to Nature Directives

See also the schema on the Article 17 data flow in the Annex.

(ii) Data flow Nationally Designated Areas (CDDA)

The table below describes the data flow in 2009.

Area covered	EU member states, Council of Europe, EEA member countries
Main data items	Basic description of sites, digital boundaries of the sites, designation type and year
Data input	Member States update descriptive data within recent version provided as Microsoft Database on ReportNet, for each MS the according mdb file is provided, GIS data are replaced with new versions send by MS
Data structure	see DD
QA	Via Microsoft macros provided by EEA, check basic integrity of data, MS use macros to carried out QA before uploading new version, QA for GIS data not automated
QC	Manually, in 2009 by ETC/BD
Data processing	"Cleaned" version stored within ReportNet for next update by MS European data set compiled from single MS datasets - descriptive data: concatenation of MS datasets - spatial data: gridded in order to calculate data for indicator (automation under development)
Particularities	WDPA[3] unique identifier for sites
Update cycle	Once a year
Main use	- European contribution to WDPA - Production of Core Set Indicator CSI 008

Further development: pilot to harvest data from MS via OGC conform services scheduled for 2009, subsequent the traditional data flow will be replaced by distributed system in line with SEIS principles.

[3] World Data Base on Protected Areas run by UNEP-WCMC, http://www.wdpa.org/

3.3 Relevant bodies

- Expert Group on Reporting under the Nature Directives

  The Expert Group on Reporting is essentially looking at the main issues around the Reporting in the context of the Habitats and Birds Directive. This involves the standardisation, synchronisation and modernisation of the dataflow (use of IT-tools) as well as proposals for the presentation of these data and their analysis.

  The group consists of experts from Member States, representatives of the European Environment Agency (EEA) and its Topic Centre on Biological Diversity (ETC/BD), the nature-NGO community (via the European Habitats Forum), the land-users community (via the Natura 2000 Users Forum) and the European Commission (DG ENV plus other services depending on the topic, e.g. DG Research, DG DIGIT, JRC, ESTAT/GISCO).

- INSPIRE Directive

  INSPIRE is an EC Directive establishing an Infrastructure for Spatial Information in the European Community. This Directive is relevant for the BDC in terms of obligation and infrastructure. It provides the backbone for the exchange of spatial information.

  Protected areas are part of Annex I and a draft data standard for protected sites which are currently be consulted on. The format is relatively complex with a range of descriptive data encoded in XML. The Thematic Area III of INSPIRE is concerned with the occurrence of habitats, biotopes and species as well as data stemming from environmental monitoring facilities.

- The Shared Environmental Information System (SEIS)[4]

  The Biodiversity Data Centre is one of the building blocks of SEIS. Therefore the SEIS legal proposal and the SEIS principles will be applied to the BDC.

- GBIF (Global Biodiversity Information Facility)[5]

  GBIF aims to provide an efficient means of providing access to species observations. The initiative has developed a data provider tool that allows a user

[4] http://ec.europa.eu/environment/seis/index.htm
[5] http://www.gbif.org/ & http://www.gbif.net

to set up a node on the GBIF network and publish data through it. The software also provides a basic suite of functionality to allow the data published to be viewed on-line. There is some momentum behind developing the network further across Europe. GBIF relies strongly on the standards, protocols and tools developed within the TDWG.

- TDWG (Biodiversity Information Standards, former name Taxonomic Database Working Group)[6]

  Biodiversity Information Standards (TDWG) is an international not-for-profit group that develops standards and protocols and tools for sharing biodiversity data. These standards are widely used.

- The Conservation Commons

  The Conservation Commons is the expression of a cooperative effort of non-governmental organizations, international and multi-lateral organizations, governments, academia, and the private sector. This ensures open access and fair use of data, information, knowledge, and expertise on the conservation of biodiversity. It aims at developing and adopting standards for integrating interoperability assets.

- Research programs (selection)

  EBONE European Biodiversity Observation Network

  Is a more research focused initiative (EU FP7 project)[7]. The key challenge is the development of a cost effective system of biodiversity data collection at regional, national and European levels. EBONES aims to assess a range of methods for using remote sensing for assessing habitat type and explore how applicable the techniques would be at a European scale, If developed this would essentially provide a means of assessing changes in habitat coverage at a European scale.

  ALTER-Net

  Is a more research focused FP 6 Network of Excellence in the area of LTER (Long Term Ecological Research) and Biodiversity. In this project, a Semantic approach

[6] http://www.tdwg.org
[7] http://www.ebone.wur.nl/UK/

to data storage and integration was designed and prototyped. A related Network of Excellence, Marbef, is focussing on marine biodiversity.

Lifewatch

Lifewatch is an initiative under ESFRI, the European Strategy Forum on Research Infrastructures, for the creation of a research infrastructure for the domains biodiversity and LTER, taxonomy and marine ecology. Related to Lifewatch is the project PESI, which is developing a common taxonomic nomenclature across Europe

4 Issues identified

Analysing the current situation (see chapter 3) with regard to the objectives described in chapter 2 the follwing issues can be identified:

4.1 General issues

- Lack of clear and transparent description of management and support of the existing elements which are considered as constitutens for the Biodiversity Data Centre.
- Lack of consistency in reporting mechanisms (e.g. between the Natura 2000 data and the CDDA data)
- Current reporting mechanisms are quite onerous (involving the generation of relatively complex XML) and there are currently no tools or assistance to help the MS generate this.
- Inspire has to be implemented and well understood in order to ensure working systems.
- Standardised tools both for the generation of required data as well as for the online provision of this data in accordance with INSPIRE requirements could be advantageous.

4.2 Data on protected areas

- Difficulty in linking between data on protected sites resulting from different data flows (e.g. Natura sites and CDDA).
- Active cooperation between MS needed to avoid different interpretations on SEIS priciples according to protected sites

4.3 Data on species

- The organization and dataflow of Red List information provided within EUNIS is not consolidated.
- Consistency in key mechanism across initiatives, for example the dictionary within PESI is different to EUNIS or the Non-native species portal.
- The species data are not categorised by other than taxonomic hierarchy (e.g. categories like invasive species, crop wild relatives are currently missing in EUNIS)

4.4 Data on habitats

- The spatial resolution of data available at European level regarding the distribution of habitat types is inadequate. Especially for the data used in the context of the Habitats Directive a finer spatial resolution is needed to allow for adequate analysis and assessment.
- The Ecosystem classification used within the EBONE project is optimised for data collation. The linkage between the Habitat types of the Nature Directive, EUNIS and other system used is not clarified, matching needed.

4.5 Data on Action / Management

- Difficulty to inspire the Member States in providing this sort of information. As part of Article 17 reporting member states did have the opportunity to add a textual comment relating to management, but the reporting was very weak and the data obtained through that of limited use. This was mainly due to the reporting format and questions formulated.
- For Biodiversity Action Plan (BAP) reporting an adequate tool does not currently exist. Currently the needs for such a tool are being

defined by DG Environment. Following on from that existing tools will be investigated.

4.6 Other

- Relationship to European RTD Framework Programmes and project outcomes should be improved.
- Improvement of Information Networking on the global level is necessary, for example linkage to World Database on Protected Areas.

5. Proposed process for implementation

The proposed approach for the implementation of the Biodiversity Data Centre aims to ensure that the activities are carried out in an approriate and clear organisational structure, which is considered as essential for a successful result. In order to make sure that the results of the activities provide the solutions needed it is necessary to describe in detail how it will be put to use. It is important to have a clear and detailed description of the goals, the objectives, the settings of the Biodiversity Data Centre as well as of the organisational relations.

Description of Goal

1 – Together with users and other relevant stakeholders, define possible user requirements and communicate with concerned parties in order to ensure a shared view of the goal of the Biodiversity Data Centre. The description must be easy to understand and not technical in its nature. The user requirements will flow into the list of deliverables.

Objectives

2 – User needs should be mapped preferable as UML Use Cases Diagrams. These will clearly detail all user requirements.

Settings

3 – Map the surrounding organisation demands and connections to other systems and datasets in a clear and understandable way. This should include all existing and proposed data and information flows. A UML Activity Diagram could be suitable for these needs.

4 – The process must be modelled and documented. Ownership must be clarified.

5 - Define a data model that incorporates all requirements identified. This specification should take existing data standards, e.g. TDWG, into account.

6 - Create a functional specification for the data and information flows required by the BDC

7 - Create a technical specification for the data and information flows required by the BDC This specification should take existing tools into account.

8 – Create the process for developing and publishing the BDC.

9 – Provide the technical devices and develop the system.

10 – Create the process for the running of the system.

11 – Delivering the system to the owner (end project).

Organisational relations

Product owner – start and close project, accept delivery, clarify demands

Product owners representative – expert on the topic, accept part delivery

Project leader – run the project

Project method – known and communicated

Suggestion of work method – using an Agile[8] development methodology ensures that the results are in compliance with user demands and that resources are used efficiently. Rapid prototyping and an iterative approach, as defined by the Agile methodology, will allow users early access to initial versions of the system, avoiding implementation of ineffective solutions.

6. Actions for 2009-2013

General

- Define the process, management and administration for the BDC.
- Define host and level for the portal needed for the BDC tasks.

[8] http://en.wikipedia.org/wiki/Agile_software_development

- Clarify relationship with BISE and EC-CHM.
- Set up agreements on storage and/or access to data hosted by other data centres/institutions ("foreign" datasets).

2009

- Set up goals for 1, 5 and 10 years, where will the BDC be at that time.
- Improve access to Natura 2000 data for specific needs within DG Environment.
- Article 17 reporting database on Internet.
- Update EUNIS database, enhance data management
- Make Natura 2000 and CDDA data available to the public.
- Implement procedure to produce SEBI Indicator Nationally Designated Protected Areas from CDDA dataset

2010

- Improve current reporting tool.
- Range tool for next Article 17 report.
- Improve national coordinate conversion system.
- Streamlining CDDA and Natura 2000 database, enhance data structure.
- Redesign the EUNIS portal, improve linkage to Natura2000 database and CDDA
- Standardized taxonomic database for all EU involved actions.
- Standardized and streamlined database for EUNIS habitats.
- Implement update procedure for the European Red list.
- Design expansion of scope (SEBI, policy implementation information).
- SEBI 2010 indicators summaries and results.
- Improved database for invasive species and links towards SEBI 2010.
- Create and maintain the data sets needed in order to produce a quantitative analysis of the data for the presentation of all indicators at the European level.
- Improve relations to LifeWatch, EBONE and other research founded projects.

Possible future data flows for the BDC

- Country profiles
- Observation datasets on species and habitats (Inspire thematic area III, GBIF)

- Ex situ datasets
- European Atlas Schemas
- Research Projects (e.g. Alarm)
- Other national biological recording datasets

List of consulted papers

1. Building and integrating European Environmental data centres: towards data and architecture guidelines. Draft position paper by SJE 21 April 2006.

2. Technical arrangement of the Group of Four on environmental data centres, 14 Nov 2005 by DG ENV G3

3. Conclusions from the EEA MB seminar on SEIS, 22 Nov 2006

4. EEA detailed work programme for 2007-2008 for SEIS implementation, due 20 Jan 2007

5. EEA paper for 47th Management board (21 Mar 2007) on the activities of Go4 and the benefits and associated risks of SEIS, due 28 Feb 2007

6. European Commission, Communication on Biodiversity, May 2006: halting the loss of biodiversity by 2010 and beyond- sustaining ecosystem services for human well being http://ec.europa.eu/environment/nature/biodiversity/current_biodiversity_policy/biodiversity_com_2006/index_en.htm

7. State-of-play on the EEA data centres and prospects for 2007-08: Towards EEA Data centre on Water. Doc. EEA/NFP/2006)03-2, Item 05b-W Sept 2006

8. State-of-play on the EEA data centres and prospects for 2007-08: Towards EEA Data centre on Land use. Doc. EEA/NFP/2006)03-2, Item 05b-LU, 8 Sept 2006

9. State-of-play on the EEA data centres and prospects for 2007-08. Towards an EEA Data Centre on Biodiversity. EEA/NFP/2006)03-2, Item 05b-BD, 8 Sept 2006

9. Eurostat work programme approval. Paper from 46th management board Doc. EEA/MB/46/11 07 November 2006.

10. ETC-BD Scoping papers on the Data centre and SEBI data needs (deliveries 2006, 2007,2008)

11. DGENV/ EEA collaboration frame (November 2008)
12. EEA strategy 2009-2013 (October 2008)
13. K.U.Leuven R&D Division SADL & GEO Solutions (2008): WISE distributed system – architecture

14. WISE as distributed system: Summary of the concept, EEA internal paper 21 November 2008

15. Common Implementation Strategy for the Water Framework Directive (2000/60/EC) Guidance Document No:NN, Updated Guidance on Implementing the Geographical Information System Elements (GIS) of the EU Water policy, 17 November 2008

ANNEX

Overview EUNIS- Content

Driver	Data set	Content	Source	Module
Pan European -global	EUNIS habitat	General information/ distribution/ legal instruments /species composition	EEA/ published references	Habitat types[9]:
EU Directives	Annex I habitat types Habitats Directive	General information/ distribution/ legal instruments /species composition	MS/ DG ENV/ published references	Habitat types
EU	Corine Biotopes	Tabular and GIS data	MS/ DG ENV	Sites[10]
EIONET	Nationally designated sites	Tabular and GIS data	Updated by EEA priority dataflow	Sites
EU	Designated SPAs **and** Adopted SCIs	Extract of attributes from DG ENV Natura 2000 data base	Updated by data flow	Sites
Pan European -global	Internationally designated sites	Tabular data	COE, UNEP/ WCMC	Sites
EU directives	Annex II & IX -V-VI species of Habitats Directive	General information/ distribution/ legal instruments /threat status/ references/ grid distribution	MS/DG ENV/published references	Species[11]:

9 Hierarchical classifications and views are available for both EUNIS and Annex I habitat types

10 All the elements on sites comprise the European Common Database on Designated Areas (ECDDA)

11 Feasibility of including Derogation reports on species is not yet available, so it is not considered as part of the Biodiversity Data centre

Overview on access points at the EEA for Biodiversity

Policy driver	Access Point / Type of data	EIONET /REPORTNET	EIONET/ biodiversity	EEA data service	EIONET/ IMS	EEA website
EEA priority dataflow	*Sites* *National*	national deliveries	EUNIS	European data sets maps	Core set indicator 008	Reports
Nature directives	*Sites* *EU*	Under preparation	EUNIS (Natura 2000 and CORINE BIOTOPES)	Natura 2000 GIS (the Natura 2000 sites database) maps	Core set indicator 008	EC-CHM
EEA memoranda of understanding	*Sites* *international*	Boundaries of Ramsar wetlands		maps		Highlights
EEA important data for assessments *(N2K, Indiactors)*	*Species and habitats* *Bibliographical / NGOs*		EUNIS		Core set indicator 007 Core set indicator 009	
Nature directives	*Species and habitats* *reporting*	national reports on Article 17 of the Habitats Directive	The Article 17 reporting database on line	graphs, maps		EUNIS database and web application
Nature directives	*Species* *derogations reports*	(under development)	EUNIS			

Overview on data item resulting from Nature Directives reporting

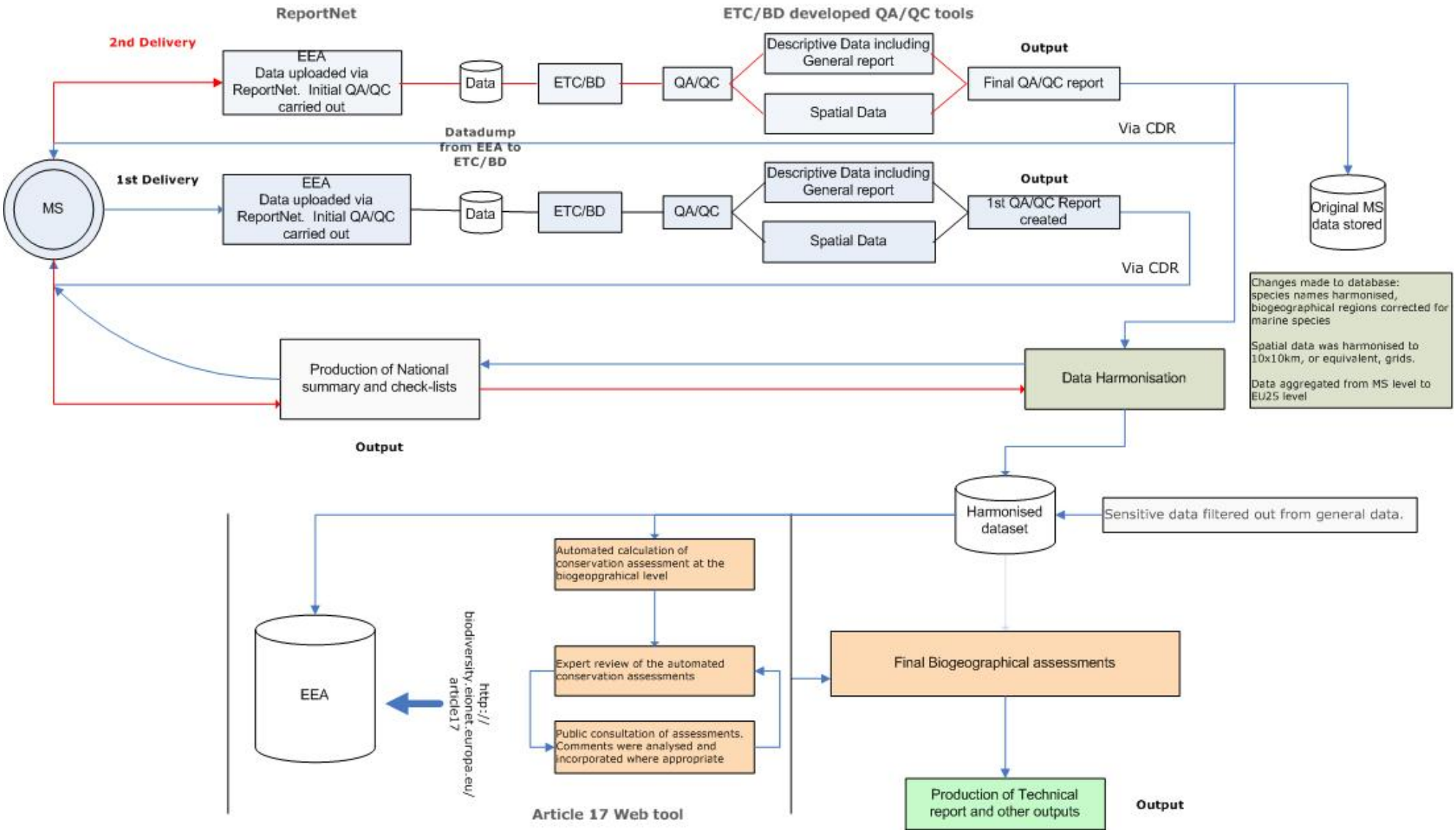
Reporting Obligation	Resulting Data Items
Derogations	**For species** • Permitted activities and actions • Reasons for granting licenses • Impact on population • Supervisory measures • Existence of national species conservation plan
Article 4(1) – Data and information of proposed Sites of Community Importance (database)	**For each Site** • Indication, Designation of the site • Location o Coordinate o Area o Altitude o Administrative and biogeographical region • Site description o General character o Quality and importance o Vulnerability o Ownership • Protection status • Impacts and activities in and around the site o General impacts and activities, area affected o Site management and plans, body responsible • Annex I Habitat types present on the site and site assessment for them o Area o Representativity o Relative surface of the habitat o Conservation status o Global assessment • Species present on the site and site assessment for them o Population size o Isolation o Conservation status of habitat important for this species o Global assessment
Compensatory measures	description of compensatory measures

Reporting Obligation	Resulting Data Items

Implementation measures & conservation status	**General, for each country:**
	Management tools
	• Management plans
	• Management bodies
	• Other planning instruments
	• Non-planning instruments (e.g. management agreements)
	Measures
	• Conservation measures (Art. 6(1)) and evaluation of their impact on the conservation status (Art. 17(1))
	• Measures to avoid deterioration of habitats /habitats of species & disturbance of species (Art. 6(2))
	• Measures taken in relation to approval of plans & projects (Art. 6(3, 4))
	• . Measures taken to ensure coherence of the Network (Art. 10)
	• Measures taken to establish a surveillance system (Art.11)
	• Measures taken to ensure the protection of species (Arts. 12 to 16)
	• Supporting Measures and additional provisions
	• Financing (Art. 8)
	
	For each biogeographical region:
	<u>Monitoring data on Species of the Habitats Directive</u>
	• Range and trend
	  • Map of the range (10x10 km grid) as well as of the known distribution
	  • Area of the range
	  • Trend of the range (descrising, stable, incrising)
	• Population size and trend
	  • Size of the population
	  • Trend of the population (and magnitude), reasons for the trend if known
	  • Main pressures and threats
	• Habitat for the species
	  • Habitat type
	  • Area
	  • Quality of the species habitat
	  • Trend for the species habitat
	5 Future prospects for the species
	• Favourable reference
	  • Range
	  • Population
	  • Suitable habitat

Reporting Obligation	Resulting Data Items

	• Conclusion on
	  • Range, population, habitat for the species, future prospects
	  • Overall conclusion
	
	<u>Monitoring data on Habitats of the Habitats Directive</u>
	• Range and trend
	  • Map of the range (10x10 km grid) as well as of the known distribution
	  • Surface area
	  • Trend of the range (and magnitude)
	• Area covered by the habitat
	  • Surface area
	  • Area Trend
	• Main pressures and threats
	• Favourable reference
	  • Range
	  • Area
	  • Typical species
	• Conclusion on
	  • Range, population, habitat for the species, future prospects
	  • Overall conclusion



Schema of the Article 17 dataflow from delivery by the Member States to the completion of the technical report

Identification of data sharing needs

Priorities of data sharing needs with other data centres

Identification of data sharing needs and links between the data centres have to be further worked out. For the BDC, the focus should be to investigate the need for data sharing within the most important overlapping areas – the data centres Forest, Land Use, Water and the basic services (like spatial data). The need for data sharing in order to produce the SEBI indicators is as described in chapter 2.1.2.

Furthermore, it is to be foreseen, that the projects dealing with Ecosystem Assessment for Europe (Eureca) will be a major client to the Biodiversity Data Center.

Very recently (End November) DG ENV and EEA have consolidated their framework on collaboration DG ENV on biodiversity and ecosystems for the next couple of years. More specifically this framework refers to collaboration on Information management policy, Expert support in the Implementation of EU nature legislation, Areas of Common Interest for further development. Further details on data sharing needs will be investigated in the beginning of 2009. We should strive to ensure compatibility with data flows from these related areas.

The table below gives an overview on the priority for data sharing needs with other Environmental Data Centres.

Data Centre	Relation to BDC	Priority
DC Air	Exceed of N and acidifying substance deposition, exposure to air pollution	Low
DC Climate change	Non-point GHG emissions, biomass production, carbon sequestration, adaptation of socio-economic and natural systems	Low
DC Land Use	Land use and transport pressures on ecosystems, Land use pressures on coastal zones, Seabed mapping	Very High
DC Water	Quality of inland waters, Quality un coastal and marine waters, Fisheries, Aquaculture, Marine assessments	High
EEA SDI	Many very relevant geospatial data sets, implementing spatial data standards (INSPIRE, ISO 19115)	Medium

DC Forest	Not adequately investigated	*Expected to be high*
DC Soil	Not adequately investigated	*Expected to be medium*
DC Waste DC Natural Resources DC Integrated Product Policy	Not adequately investigated	*Expected to be low*

Priorities of data sharing needs with other SEIS nodes

Furthermore other SEIS nodes are expected to share information with the Biodiversity Data Centre, as described below:

EEA SEIS node	**Relation to BDC**	**Priority**
EIONET (with links to national SDI)	The data sharing needs between Data providers, data users software users and network members	High
Academia/ Research community	EEA Scientific Committee, ETC partners from Universities, FP6 and FP7 projects, Project advisory boards	Medium
Civil society (NGO-s)	Data providers for species data and species assessments	Low/Medium
International organizations and Conventions	Data from Convention secretariats (eg CBD, Ramsar Convention), UNEP /WCMC, Council of Europe, OECD, GBIF, IUCN	Medium
Industry (private actors)	*Inter alia* GMES service elements for forests and marine issues	Low
Local governments (managers and practitioners)	Case studies	Low

Overview on existing elements of EEAs information infrastructure for the theme Biodiversity

The Biodiversity Clearing House Mechanism (EC-CHM)

The EC Biodiversity Clearing House Mechanism of the European Communities (EC-CHM) site is managed by the EEA, which is designated as the EC Clearing House Mechanism Focal Point by the European Commission. This site has been established in order to fulfil the obligation of the European Communities being a signatory party to the Convention on Biological Diversity. The objective of the EC Biodiversity CHM is to promote technical cooperation and technology transfer within the European Union and its Member States, within the Pan European Region and the global level[12].

The European Portal Toolkit (collaboration software) is freely available to assist Parties in the establishment of their national CHMs. Currently 14 countries use this Toolkit, which is multilingual and supports cooperative work.

EEA portal with entry point to the thematic webpage for Biodiversity[13]

The thematic webpage for Biodiversity provides an introduction to the topic, overview on related Biodiversity policies and EEA activities and products related to Biodiversity[14]. The information provided is structured by following items:

- About biodiversity
- Biodiversity policies
- EEA activities
- Highlights
- Reports
- Multimedia Indicators
- Maps and graphs
- Datasets
- External links

The EIONET – ETC/BD thematic web site

The ETC/BD web site gives access to documents in order to provide technical and scientific support to the European Commission, DG Environment, and the Member States in implementing the Birds Directive (79/409/EEC) and Habitats Directive (92/43/EEC), particularly for the establishment of the Natura 2000 network. Furthermore other documents like reports and working papers of the ETC/BD are presented.

12 http://biodiversity-chm.eea.europa.eu/About/fol913131
13 http://www.eea.europa.eu/themes/biodiversity
14 http://www.eea.europa.eu/themes/biodiversity/intro

Biogeographical assessments - Article 17 Web Tool

Article 17 Web Tool[15] is on order to support the biogeographical assessments of conservation status for species and habitats, as reported by Member States according to the provisions of Article 17 of the Habitats Directive. The content provided is on Biogeographical assessments at Member State level:

- Species assessments (stakeholders comments)
- Habitats assessments (stakeholders comments)
- National Summaries (statistics)
- Checklists

Biogeographical assessments at EU level:

- Species assessments (stakeholders comments)
- Habitats assessments (stakeholders comments)
- Consultation process

This site is currently being adapted to become the web-based Technical Report of Article 17.

The EIONET - ReportNet

ReportNet is the data reporting system (repository) of EIONET. It consists of a group of web applications and processes developed by the EEA to support international environmental reporting. Within the ReportNet architecture are a number of repositories, the three principle ones are ROD, DD and CDR

Reporting Obligations Database (ROD)

ROD[16]: The Reporting Obligations Database is a part of ReportNet and contains records describing environmental recording obligations that countries have towards international organisations. With ROD there are two levels of records, the Upper level is the legislative instrument (LI) level and the lower level is the reporting obligations (RO) level.

Central Data Repository (CDR)

The CDR (Central Data Repositry[17]) is part of the Reportnet architecture; it is a data repository for EIONET priority data. With CDR each country has a collection (envelope) for its deliveries; within these collections are sub-collections where the reports mandated under different reporting obligations are arranged. The uploading of data to CDR is manual; the architecture of the system is designed around this concept. There are a number of steps involved in uploading data. An authorised user needs to create

[15] http://biodiversity.eionet.europa.eu/activities/Natura_2000/article17
[16] http://rod.eionet.europa.eu/text.jsv?mode=H
[17] http://cdr.eionet.europa.eu/

an envelope, upload the data manually, set the access to the envelope and activate the "release" of this envelope and its corresponding data.

Data Dictionary (DD)

The Data Dictionary (DD) is a central storage for the technical specifications of data requested in reporting obligations. It provides countries with detailed specifications of what to produce and report in a comparable way; data file structures, such as definitions of data sets, tables, data elements, allowable values and other technical requirements. The tool, currently under development, also provides algorithms needed in data validation and serves as a reference for users.

The EIONET Indicator Management Service (IMS)

The IMS application allows thematic and sectoral experts working with EEA to draft specifications for the indicators required by the EEA work programme. IMS is one of the modules within the ReportNet concept. IMS reduces the burden of managing indicators by providing centralized and formatted storage for contents while responsibility for drafting, approval and quality control remains with the appropriate experts. The IMS is integrated with the EEA Data Service and the Reporting Obligations Database (ROD)[18].

The EEA Data Service [19]

The data service provides European datasets and maps for the theme Biodiversity for download. The European Environment Agency has a policy of open and easy access to the data and information (for terms of reference see http://dataservice.eea.europa.eu/dataservice/termsofuse.asp).

The enhancement of the data flow supporting Nature Directives reporting, CDDA and Indicators are priority activities. The establishment of additional data flows should be scheduled. Linkages to European RTD Framework Programmes and project outcomes should be improved. Improvement of Information Networking on the global level is necessary (e.g. linkage to World Database on Protected Areas).

The existing arrangement of the components of the EEA's information infrastructure as described in 1.2 should be revised to allow a coordinated entry to information products and reporting facilities of the Biodiversity Data Centre. Significant instruments that have been developed and maintained by the EEA and the ETC/BD, namely EUNIS and the EC-CHM should be enhanced and better integrated.

[18] http://ims.eionet.europa.eu/IMS/About/whatisims
[19] http://dataservice.eea.europa.eu/dataservice/available2.asp?type=findtheme&theme=biodiversity

Lessons learned from similar approaches (*inter alia* from Artportalen in Sweden and the similar approach in Norway and Finland, the National Biodiversity Network (NBN) in the UK, other elements for a global and European Biodiversity information infrastructure like GBIF, EDIT and other projects financed to enable interoperability of Biodiversity related data should be formulated.

Standards and services for Biodiversity data should be used, and further developed (if necessary) and propagated.

Glossary

BAP

Biodiversity Action Plan

BDC

Biodivrsity Data Centre

BISE

Biodiversity Information System for Europe.

CDDA

Common Database on Designated Areas, or more precisely the European common database on nationally designated areas, is a joint project between the EEA, the Council of Europe and the UN WCMC.

CDR

The Central Data Repository is part of the Reportnet architecture; it is a data repository for EIONET priority data.

CIRCA

Communication and information resource centre administrator (CIRCA) is a repository where file scan be uploaded.

CSI

Core Set Indicators

DD

Data Dictionary

DG ENV

Directorate-General Environment

EEA

European Environment Agency

EC_CHM

European Commission Biodiversity Clearing House Mechanism is a facility set up in accordance with the Convention on Biological Diversity with an aim to promote technical cooperation and technology transfer within the European Union and its Member States, within the Pan European Region and the rest of the world.

EIONET

The European Environment Information and Observation Network is a partnership network of the European Environment Agency (EEA) and its member and cooperating countries

Emerald

Is an ecological network made up of “areas of special conservation interest”, which was launched by the Council of Europe as part of its work under the Bern Convention.

ESTAT/EUROSTAT

Statistical Office of the European Communities (DG ESTAT)

ETC/BD

European Topic Centre on Biological Diversity

EUNIS

European Nature Information System, the data sets included are maintained by the ETC/BD fro the EEA and EIONET in order t be used for environmental reporting and for assistance to the NATURA2000 process (EU Birds and Habitats Directives) and coordinated to the related EMERALD Network of the Bern Convention.

GMES

Global Monitoring for Environment and Security is a European initiative for the implementation of information services dealing with environment and security

G04

Group of Four (DG ENV, DG ESTAT, DG JRC, EEA)

JRC

The Joint Research Centre provides scientific and technical support for the conception, development, implementation and monitoring of EU policies.

INSPIRE

Directive 2007/2/EC of the European parliament and of the Council establishes an Infrastructure for Spatial information in the European Community.

Natura 2000

Is an ecological network of protected sites within the European Union. The basis of Natura 2000 are the Habitats Directive (92/43/EEC) and the Birds Directive (79/409/EEC)

NFP

National Focal Points

NRC

National Reference Centres

Interoperability

is defined as "the possibility for data sets to be combined, and for services to interact, without repetitive manual intervention"

ReportNet

Reportnet is the data reporting system (repository) of EIONET. It consists of a group of web applications and processes developed by the EEA to support international environmental reporting

ROD

The Reporting Obligations Database is apart of Reportnet and contains records describing environmental recording obligations that countries have towards international organisations.

Spatial data

is defined as "any data with a direct of indirect reference to a specific location or geographical extent" INSPIRE Article 3.3.

SEIS

Shared Environmental Information System

SOE

State of the Environment

UNESCO

United Nations Educational, Scientific and Cultural Organization

WISE

Water Information Systems for Europe.

WCMC

Un World Conservation Monitoring Centre