SEVENTH FRAMEWORK PROGRAMME

EBONE
EUROPEAN BIODIVERSITY OBSERVATION NETWORK

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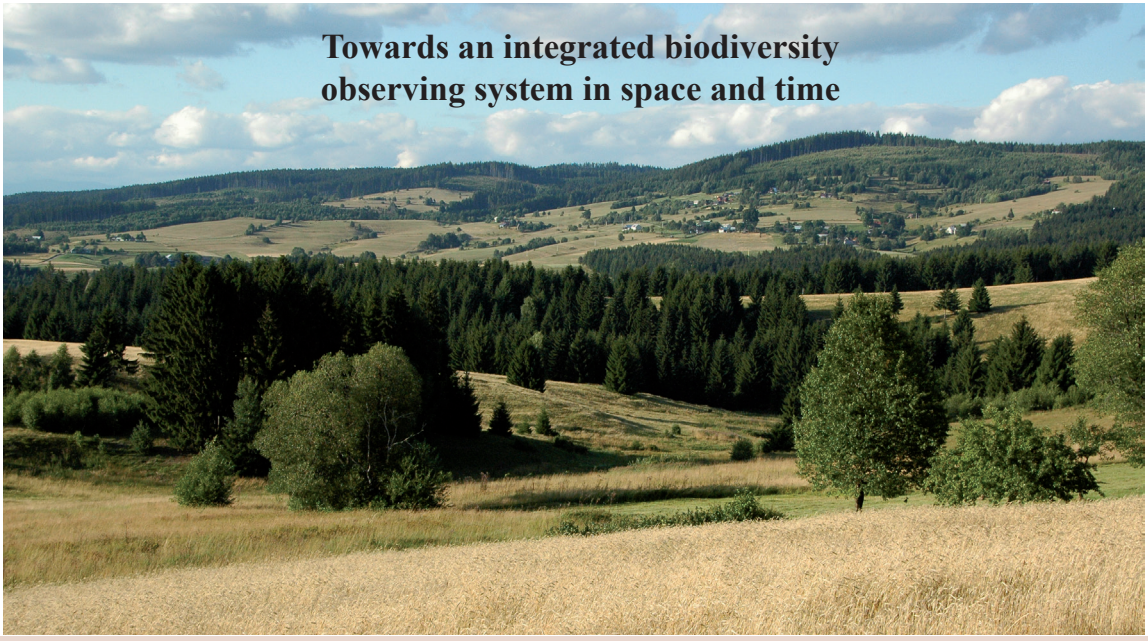
European Biodiversity Observation Network



FP7 - Collaborative Project Theme 6, Environment, Topic 4.1.1.2.
Contribution to a Global Biodiversity Observation System.

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Project objectives

1. Provision of a sound scientific basis for valid statistical estimates of stock and change in key biodiversity indicators. These can be used by policy makers who must respond to EU Directives for threatened ecosystems and species.
2. Development of a system that estimates past change and forecasts scenarios. These can be used to test policy options and design management strategies for threatened ecosystems and species.

The main outcome

A fully integrated system based on key biodiversity indicators and implementation within an institutional framework operating at the European level.

Why is an integrated Biodiversity Monitoring System needed?

Measuring and reliable reporting of trends and changes in biodiversity requires that data and indicators are collected and analysed in a standard and comparable way. However, at present, the responsible authorities in Europe (over 100 national and regional agencies) have different and uncoordinated approaches; worldwide the problem is even greater. Therefore there is a need to develop a coherent system for data collection that can be used for assessments at the European and global scales.

EBONE will deliver a European contribution to the development of a global biodiversity observation system that is spatially and topically prioritised. It will also build on existing information.

Results achieved so far

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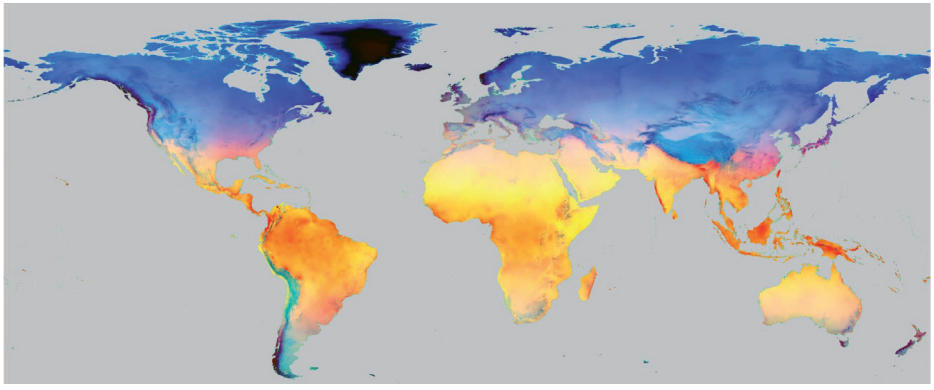
Elaboration of a monitoring concept

The most significant gaps for the delivery of biodiversity indicators are in systems for monitoring changes in the extent and quality of habitats and the lack of systems and models for combining in situ observations with remotely sensed data to provide reliable European statistics and „wall to wall" assessments of a broader range of biodiversity indicators.
EBONE would focus on three main categories of indicators covering:

- **habitats of European interest in the context of a broad habitat assessment;**
- **abundance and distribution of selected species (birds, butterflies and plants);**
- **fragmentation of natural and semi-natural areas.**

European and global stratification for monitoring purposes

- European environmental stratification developed
- Progress in development of a global environmental stratification - in co-operation with GEO-BON: a new first tier classification using existing bio-climate data; the first map produced and tested.



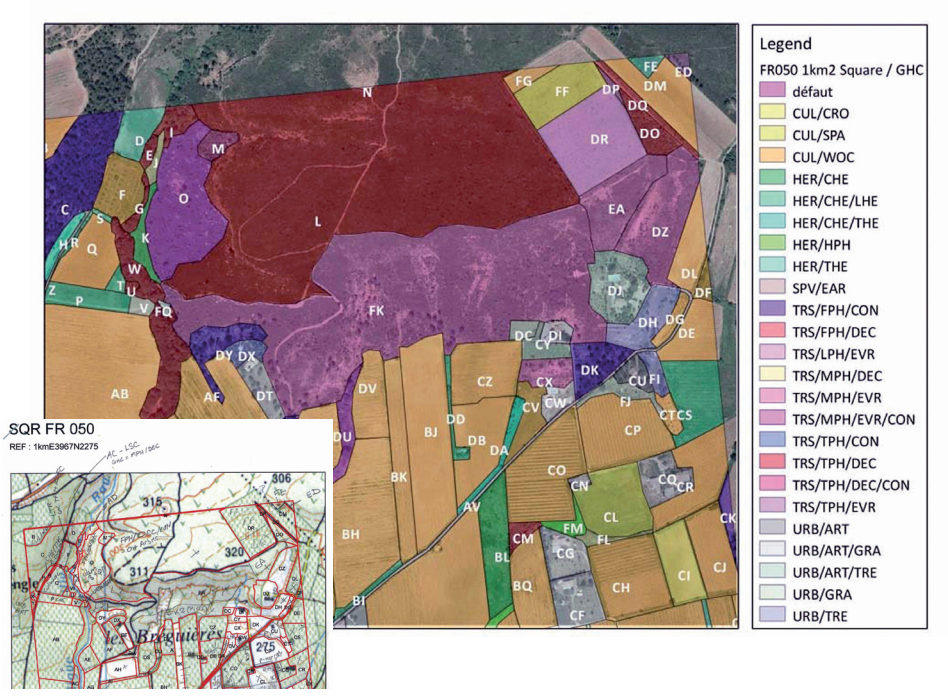
Principal components layer underpinning the Global Environmental Stratification.
Author: Marc Metzger, University of Edinburgh

Review of biodiversity monitoring in Europe

- EU and international policies analysed for topical and spatial biodiversity priorities
- Preliminary results from the EuMon database on biodiversity monitoring in Europe:
  - more than 600 schemes; 169 schemes for monitoring habitats (35 of them at national scale);
  - bird and butterflies show highest international coverage;
  - data-availability: generally no free access but on request

Development and testing of standard field site observations and database management

- Several years of effort finished by completion of methodology that was tested in different environmental settings
- Methodology based on life-forms and General Habitat Categories

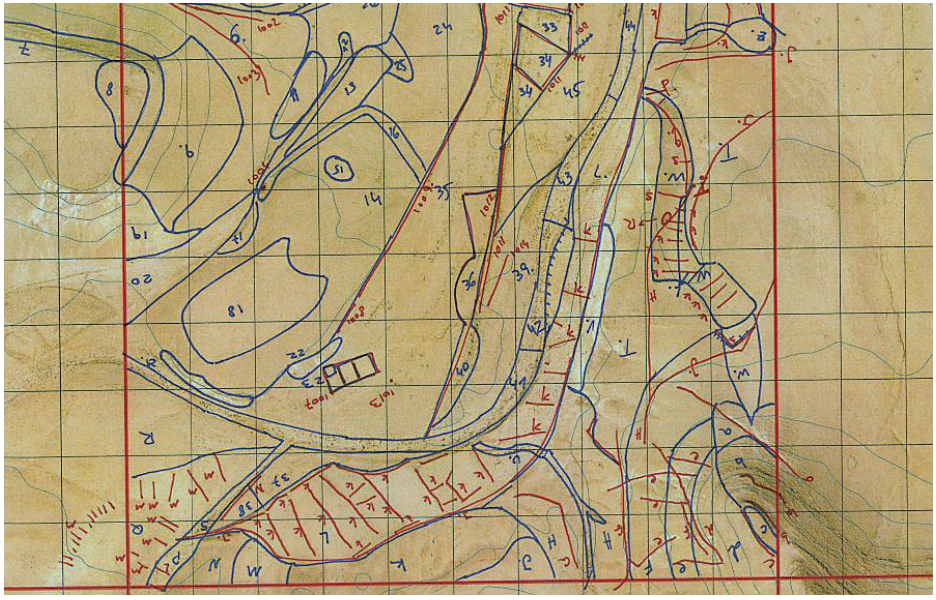


Mapped 1 km square in south France, legend shows GHCs
Author: Philip Roche, CEMAGREF

- The methodology ready for massive field testing and application
- The field handbook completed and published in the web site
- Rule-based system for indicators and Annex I habitat developed and ready for the use
- The software for field mapping using field computers developed and successfully tested
- Both software and database will be freely available
- European sample design for test sites prepared
- Field training courses held in spring 2010, main field testing in 2010 and 2011 across Europe

Pilot monitoring system for global Mediterranean regions

- Monitoring methodology tested in Israel and South Africa and updated by new GHCs and parameters not occuring in Europe
- Correlation of Mediterranean mapped habitats with Lidar data was conducted, LandSat and QuickBird data used in similar way
- Correlation of Mediterranean mapped habitats with plant and bird biodiversity was conducted, similar work continues in desert



Mapped 1 km square in desert, Israel *Prepared by: INPA*

Intercalibration of field data with earth observation data

- The software to produce correspondence matrices between in situ General Habitat Categories (GHC) observations and Earth Observation land cover maps has been developed and tested
- Field data are used for calibration and ground throuth of all below described approaches and methods

Phenology approach

- Analysis of time-series of vegetation indices – promissing approach for determining life forms, General Habitat Categories (GHC), habitat types and management practices
- Approach tried on grassland, wetland, forest habitats and tree species
- The approach may successfully improve the detection and classification of grasslands and forest types at regional scale

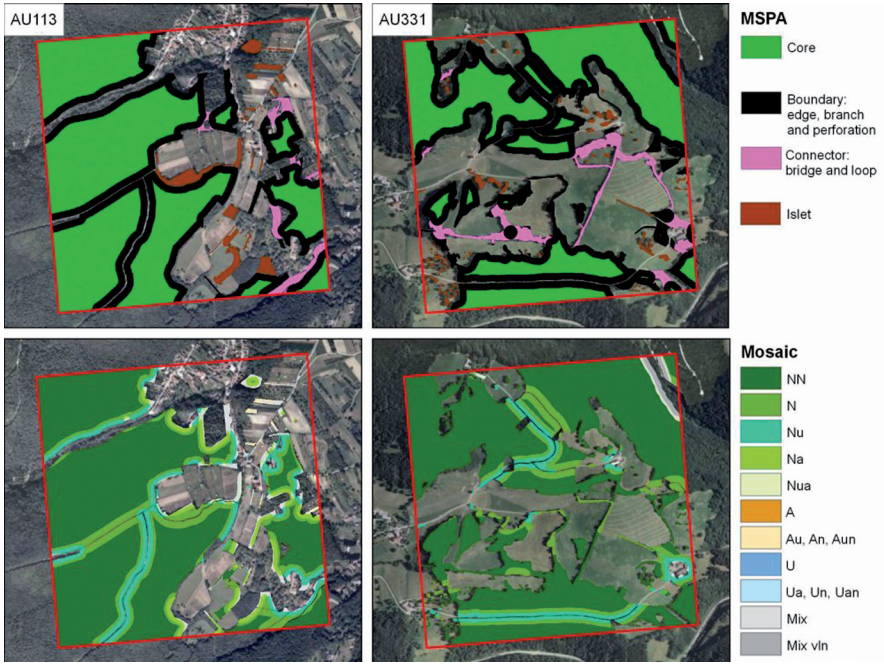
LIDAR – laser data testing

- Testing of LIDAR data potential to provide fine-grained information about the 3-D physical structure of terrestrial and aquatic ecosystems
- Conclusions: accurate vegetation height measurements, good characterisation of 3D vegetation objects and correlation with GHCs
- Combination of LIDAR data with false-colour air photos: powerful tool for identification of plant life forms

LIDAR detection of a single tree (red line: height measurement in the field)
Author: Sander Mucher, Alterra

Fragmentation and connectivity

- Standardized methods easily repeatable across scales, enabled to map the spatial pattern of a focal habitat and its edge context : Morphological Spatial Pattern Analysis (MSPA), and Landscape Mosaic Index (Mosaic)
- Connectivity have been assessed with two indices based on habitat availability and topology, and accounting for species dispersal capabilities and landscape permeability
- Forest phanerophyte habitat pattern fine-scale maps and connectivity analysis are now available for sixty 1km2 EBONE in-situ samples distributed in 3 countries and several environmental zones
- The same methods are now applied at broader scale using available Earth Observation (EO) based maps. Correspondence matrices between the GHCs and the EO based land cover have been produced



Forest habitat pattern map in Austria *Author: Christine Estreguil, JRC*

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Next steps

- Development of an institutional framework and a cost-effective framework for biodiversity monitoring
- Field handbook publication
- Development of a management system for data and relevant metadata for European Biodiversity monitoring network in standardized way
- Data analysis from field testing of the monitoring methodology

EBONE is designed to make the links between databases which are currently isolated, in order to increase their overall effectiveness. Quantitative comparisons will be made using matrices e.g. of remote sensed categories and their relationship with in situ habitat data.

EBONE contributes to:

LIFEWATCH GEO ILTER

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