Target high-level questions and gap analysis – from test sites to European datasets
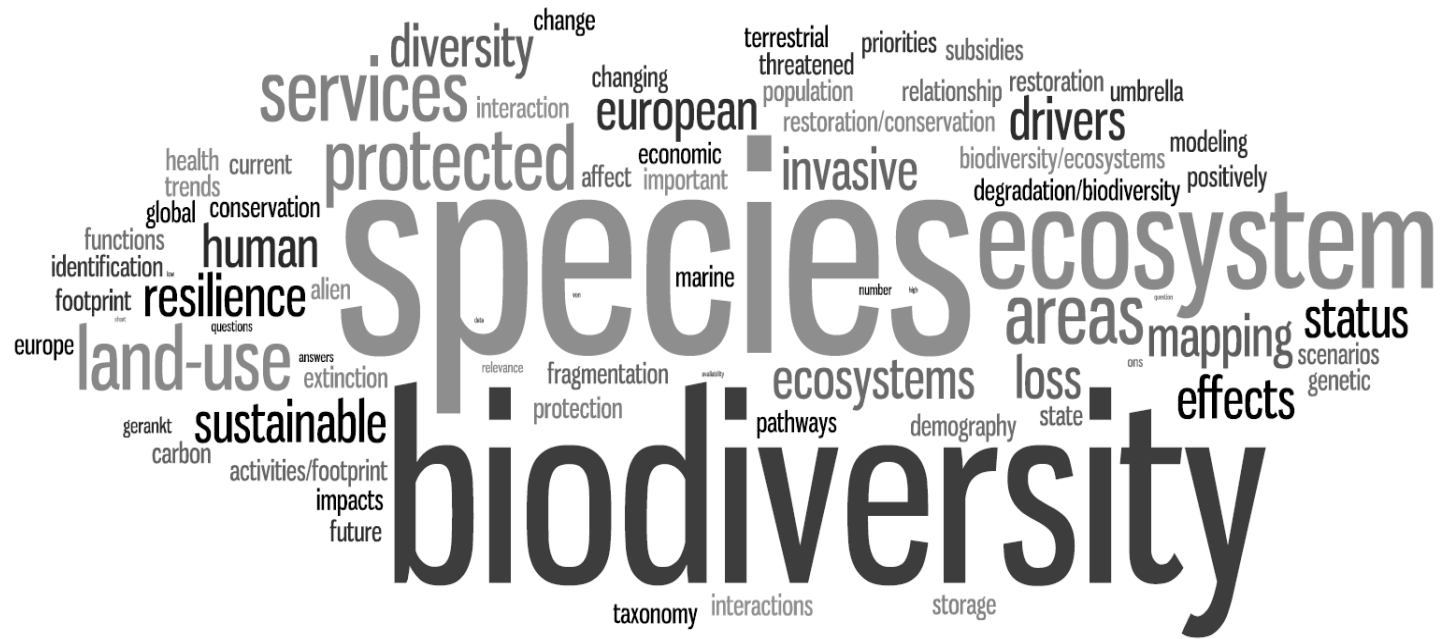
Dr. Florian Wetzel

*Museum für Naturkunde - Leibniz Institute for Research on Evolution and Biodiversity*

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SEVENTH FRAMEWORK PROGRAMME

General Overview Target Questions and Gap Analysis

Online survey on high level questions

Most important questions on biodiversity on a **European Scale for EU BON**

Policy relevance

Scientific relevance
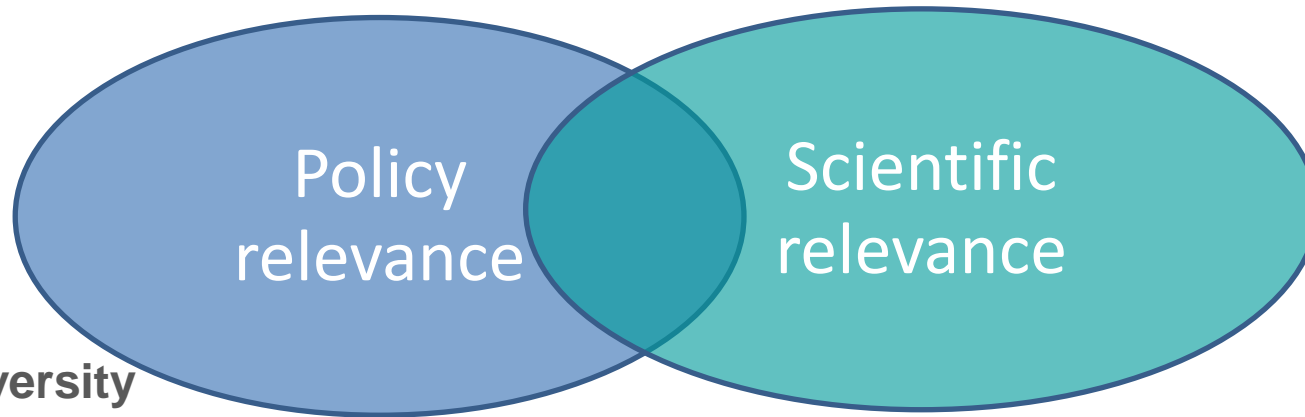
Aichi Biodiversity Targets

EU Biodiversity Strategy to 2020

Research Council recommendations to IPBES

Paper Pereira et al. (2013)

Paper Sutherland et al. (2009)

Regional → National → European → Global

+ first overview over **current gaps and limitations**
+ list of **high-quality datasets** on a European level

→ First: Online Survey   → Discussion at WP1 Meeting

Participants of the survey

25 partners from 15 countries, 894 votes:

- Ashoka Trust for Research in Ecology and the Environment – India,
- Consiglio Nazionale delle Ricerche ,ISSIA,
- European Bird Census Council - Forest Technology Centre of Catalonia (EBCC-CTFC),
- FishBase Information and Research Group Inc.,
- GlueCAD Ltd.,
- Helmholtz Centre for Environmental Research (UFZ),
- Museum für Naturkunde Berlin,
- National Botanic Garden of Belgium,
- Norwegian Biodiversity Information Centre,
- Royal Belgian Institute of Natural Sciences,
- Royal Museum for Central Africa,
- Senckenberg,
- Slovak Academy of Sciences,
- Spanish Council for Scientific Research (CSIC),
- Swedish Museum of Natural History,
- UNEP World Conservation Monitoring Centre,
- Universidade do Porto,
- University of Copenhagen-Natural History Museum of Denmark,
- University of Eastern Finland,
- University of Tartu.
- Other participants which did not state their affiliation

Belgium, Denmark, Estonia, Finland, Germany, India, Israel, Italy, Norway, Philippines, Portugal, Slovakia, Spain, Sweden, UK
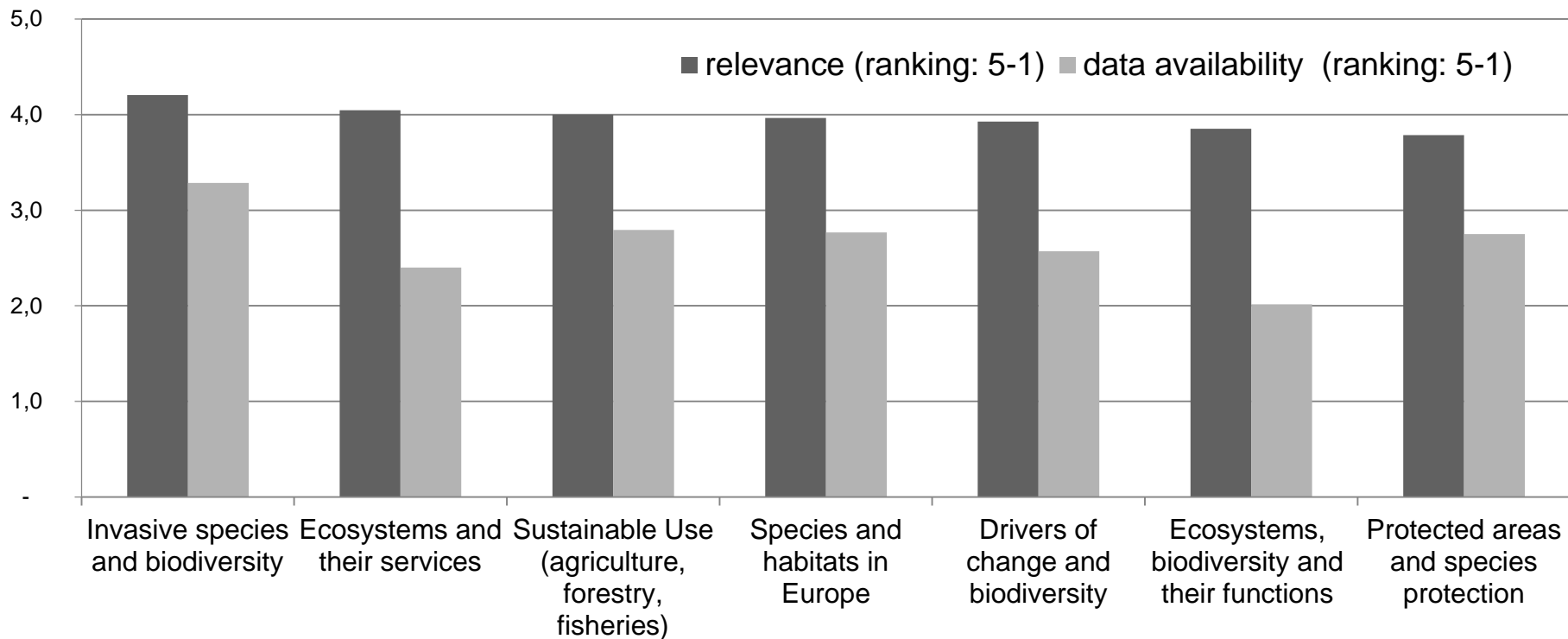
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SEVENTH FRAMEWORK PROGRAMME

Relevance of the questions vs. data availability

Average relevance of questions: 3.97 of max. 5 points
→ *represent crucial questions regarding biodiversity*

ranking of dataset availability: lower value **2.65 of max. 5 points**
→ limitations regarding the availability of biodiversity and ecosystem information

Legend: ■ relevance (ranking: 5-1) ■ data availability (ranking: 5-1)

Categories: Invasive species and biodiversity | Ecosystems and their services | Sustainable Use (agriculture, forestry, fisheries) | Species and habitats in Europe | Drivers of change and biodiversity | Ecosystems, biodiversity and their functions | Protected areas and species protection

The most and least important thematic sections

The most and least important questions

- 29 questions
- ranking varied between 3.1 (lowest) → 4.5 (highest)
- average: 4.0

High relevance

Medium relevance

Low relevance

+ evaluation of data availability

Target high-level questions

**Ranking of participants + Discussion Round Stockholm 2014**

→ 7 TARGET QUESTIONS:

1. Can we assess the **status and trends of [European] ecosystems and ecosystem services**?

2. Are we **closing the biodiversity knowledge gap** (poorly known organisms, ecosystem services, areas)?

3. Are **we filling the gaps in historical knowledge** (in relation to available historical data in collections, literature and non-mobilized digital datasets) so we can evaluate long-term trends?

Target Questions 1

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Target high-level questions

4. Can we **identify status and trends of [European] species**? Can we identify status and trends of biodiversity taking interspecific phylogenetic or intraspecific genetic diversity into account? Can we assess the risk of extinction?

5. Can we identify trends in the **spread and effects of alien and invasive species** [in Europe]?

6. Can we identify **drivers behind [European] changes in biodiversity** over time?

7. Can we assess the **effect of [European] marine and terrestrial protected areas** on the conservation of biological diversity?

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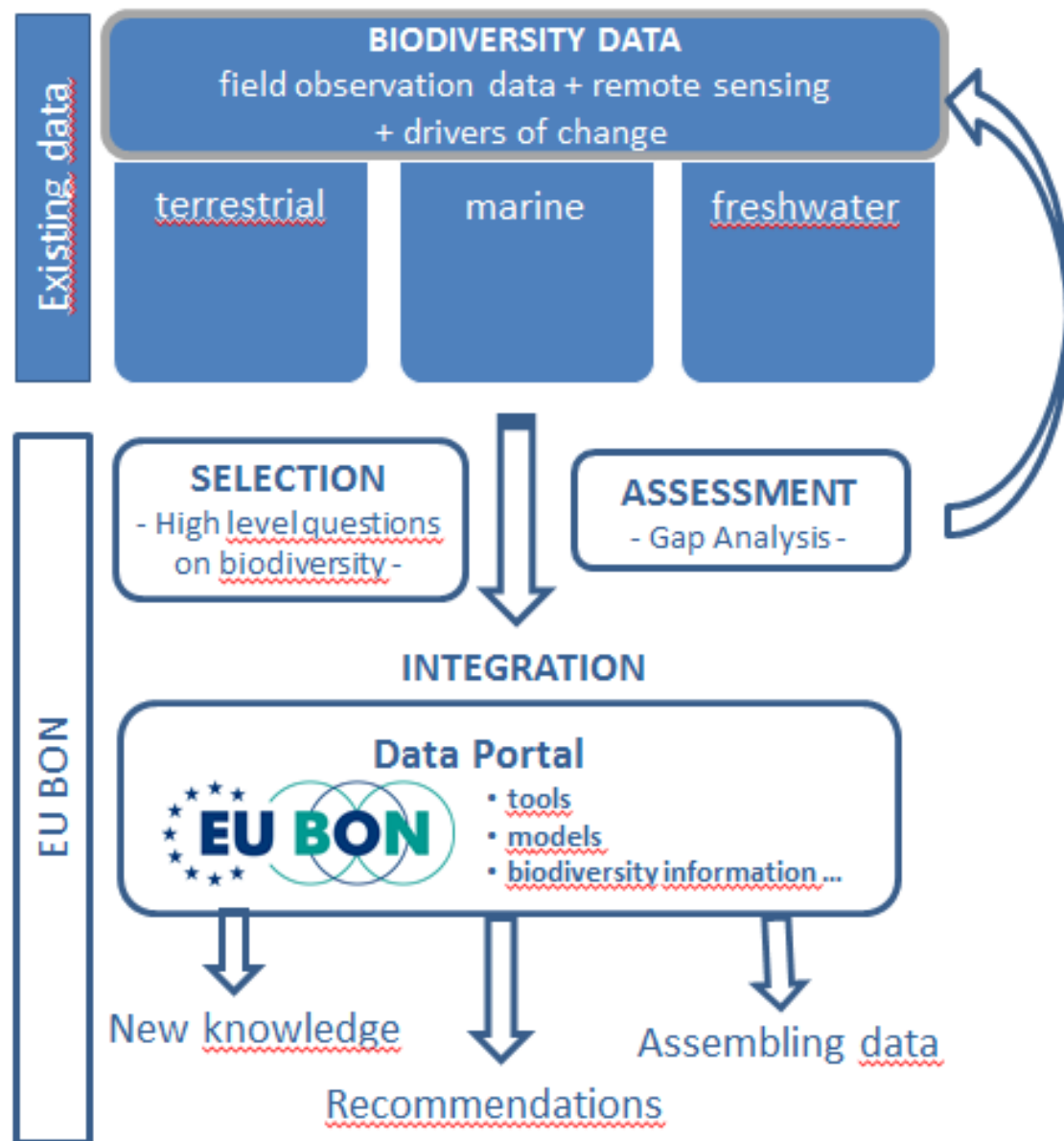
What EU BON wants:
From local to European datasets for answering target questions

Quality and Quantity: Requirements for datasets

Metadata: information about the design of the study

Spatial reference

- point data, presence/absence and better: abundance data
- information about detectability / repeated surveys,
- repeated measures preferred, mapping intensity/intervals preferably homogenous

Temporal coverage:
- Temporal reference (date, year, period) for each record
- Preferably since 1980, homogenous distribution of records over time

Monitoring data:
- Abundances for recording sites over time (i.e. 1 year time step).
- Time series > 10 years tentatively required for trend analyses.
- For some: data also within seasons.

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Quality and Quantity: Requirements for datasets

Taxonomic coverage:
- (Selected) terrestrial and fresh water vertebrates, invertebrates, selected plant taxa
- compare taxa/datasets with different degrees of limitations / list of synonyms .

Environmental data
- land-use maps with adequate resolution, and land-use changes within the period studied. DEMs will be highly useful.
- Climate data for all years
- For marine systems: currents, areas of impact (e.g. fishing pressures)

Trait data (For analysis of connectivity and range-shifts)
- data on the morphology of *individuals*, at least for selected taxa (birds, mammals, butterflies, bees, reptiles) across a climatic gradient: size, weight, wingspan (butterflies/birds)

Gap Analysis

Gap analysis of available biodiversity information sources

- **Assessments of data sources** / **review of policy requirements**
- Identify **gaps in data coverage** and **quality at the European level.**
- **Taxonomic, geographic, thematic** gaps
- **Recommendations, datasets and priority levels for closing gaps** comparing European to global level coverage.

→ dedicated **attempts at the local level - EU BON test sites (WP5)**

→ **Task 1.3 working group**

MS131: Preliminary gap analysis EU BON test sites

Gap analysis testing sites

- **inventory of existing datasets** at test sites (Amvrakikos Wetlands National Park - Greece, Doñana Biological Reserve - Spain, Rhine-Main Observatory – Germany).

- **Evaluation of existing biodiversity information** of EU BON test sites: species/taxonomic coverage, temporal resolution, accuracy and spatial resolution, data availability and accessibility

- **recommendations** for improving biodiversity data availability

Pictures: CSIC, Donana Biological Reserve, Spain.

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Examples of taxonomic gaps

Vertebrates:

- **Bird species** partially covered, some in 'raw' format
- **Mammal species will be made available (DBR), Amphibians** and **reptiles**: some datasets **exists**
- Fewer datasets on invertebrates, currently no datasets on **butterflies** (DBR to be made accessible)
- Some datasets on **plant species (Macrophytes) & landcover**

Recommendations:

- Adding new / updating existing datasets
- Data from **natural history museums, GBIF**
- **Remote sensing datasets**
- **Dynamic models**
- Data from **citizen science initiatives**

Author Charlesjsharp

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Gaps in temporal + spatial resolution

Temporal resolution:

- Majority of the 31 datasets contain data that were collected after the year 2000, 60% of the datasets cover a time span of one or two years
- Environmental data: most datasets do not cover the years before 2000

Recommendations: **complete existing datasets** + add datasets that cover the **time before 2000** (if available starting from 1980).

Spatial resolution:

- mostly point datasets
- evaluation and usefulness of the biodiversity data: **representativeness** of the point samples would be valuable
- for which species also **calculation of absence data**?

Gaps in data availability and accessibility

Examples for restricted access:

- for some datasets **only metadata** is freely available, not the data itself

- for some datasets, there are **no direct links** to the data sources / online access, such links should be created.

- some datasets had broken links to the original data sources, links needs to be checked on a regular basis.

Recommendations:

- **All datasets should become publicly online available** during the EU BON project, presumably through the EU BON data portal without any restricted access.

General further recommendations

- integrate the datasets at the EU BON data portal (→ WP2), → freely accessible

- species inventory list: Checklist

- Assemble further datasets / update existing datasets: Data on human impact / drivers of change

- Integrate further associate partners of EU BON (like Sierra Nevada LTER Site) + LIPI + INPA + Brazil

- Adding new data and updating existing datasets

Test Site Questions for the discussion

Test Sites

- How can we **overcome the gaps outlined**? What **next steps** are **needed**? How can we **prioritize**? What can we **achieve**?

  → Deliverable Gap Analysis Summer 2014

- Which **recommendations** could be obtained for other sites / on a European scale?

- Test Sites (EU BON and LTER Sierra Nevada): Link to other workpackages

  - Task 1.4 (integrated approaches data mobilization, Fredrik)

  - Task 3.4 Tools to extract prospective biodiversity literature (Donat)

  → *Special Session for the weekly WP1/WP2 Call*

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LTER Questions for the discussion

- Can **LTER provide an overview of the current gaps of LTER site data** or an **overiew of datasets** / coverage of datasets (like MS list) ?

- Can LTER network **provide datasets that meet the requirements** on a European scale → analyses + modelling + vizualisation in EU BON?

- Common **Datasets of EU BON and LTER Sites** (Sierra Nevada):
  - For which of the target high level questions can data / data processing capabilities be provided?

    E.g.: Species and ecosystem services? → e.g. **WP1 pollinators** etc.
  - For **showcases for remote sensing data** + ways for involvement of the remote sensing community?
  - **For citizen Science projects (Task 6.2 Citizen Science Stakeholder Roundtable 2014** (Katrin, Anke, Florian) **+ Task 1.5** Veljo

Thank you very much for your attention

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