

## Czech EPBRs Meeting

### World Biodiversity and the European Taxonomy

Strategies in taxonomy: research in a changing world

#### Norway

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#### National reviews guidelines

The aim of national reports and e-conference is to bring together potential users of taxonomy in Europe. The EPBRs meeting under the Czech Presidency is designed to investigate what the users of taxonomic information see as the main issues that taxonomists should focus on. Encouraging taxonomy users to participate actively in the e-conference and the meeting itself might also help to strengthen the policy bit of the science-policy interface.

The following headings will be used to structure the work of the EPBRs in the e-conference and during the meeting.

#### General comment to the questionnaire:

The approach in this questionnaire reflects too narrow a definition of taxonomy. Taxonomy is not the same as species identification. Note that research on taxonomy and systematic involves both description and classification of species and higher taxa, elucidation of evolutionary relationships, and studies of processes affecting the observed species diversity. Species identification may be executed after taxonomic research has provided the necessary results, for various purposes. This is important to emphasize as this document only focuses on the services that taxonomists may provide. The actual needs of taxonomic research and education to be able to provide such services are not addressed.

#### *1-Taxonomic Information: Strategy and Methods*

##### Inventory and Identification: "What is it, and how does it fit among its relatives?"

1.1 Does your country use taxonomy-based tools for biodiversity assessments and policy making? What are these tools?

Yes. One example is the National Red List, which is partially based on scientific collections and specimen databases. Many individual projects use taxonomic expertise in biodiversity monitoring and surveys. Another example is the tool *Artskart* (Species Map Services) which presents users with geo-referenced and scientific quality controlled

information on recorded species occurrences, and *Artsobservasjoner* a gateway for entry and reporting of species observations.

1.2 Does your country have national checklists? When were they last revised and updated? Is there any national assessment of which taxa in particular lack taxonomic information?

For certain groups checklists exist, for other groups not. A national checklist is under development by the Norwegian Biodiversity Information Centre, where 24 groups of experts work to deliver lists for the Species Name Database. This list will only cover groups where we have sufficient taxonomic expertise. As of today, this list includes nearly 60 000 names including synonyms, representing about 30 000 species.

1.3 Describe 1-2 flagship projects related to bullet points below and suggest some recommendations useful for meeting as a result from these projects: Please outline any national taxonomy-based monitoring or surveys designed to establish the distribution, status and trends of any taxonomic group

One flagship is The Norwegian Taxonomy Initiative, officially opened in January 2009, aiming to strengthen knowledge of species in Norway. Focus is particularly paid to species groups where knowledge is poor.

Another flagship is the MAREANO program which maps depth and topography, sediment composition, contaminants, biotopes and habitats in Norwegian waters. The results of the surveys are available on this website, visualised through maps.

As part of the National Programme for the Surveying and Monitoring of Biodiversity, methods for surveying and monitoring red-listed species groups are under development. Several monitoring programmes for birds and mammals are already established.

1.4 Is there any coordinated effort in your country regarding DNA bar-coding for identification or the assessment of biodiversity?

Yes, a Norwegian Barcode of Life (NorBOL) network is established as part of the iBOL project.

1.5 Are you aware of any major efforts (or projects) in your country to integrate morphological and molecular taxonomy?

Not any major efforts, but there are many minor projects doing this. A main problem is that research funding in Norway rarely opens for funding of taxonomic research.

## ***2-Taxonomy as a basis for ecological research and sustainable management of the biodiversity***

### **Ecological functions and services: "What does it do, and what does it interact with?"**

*How does taxonomic research contribute to better understanding of the functions and attributes of species, and to the management of biodiversity?*

2.1 Do you know projects involving taxonomists in the understanding of ecological functioning, or the assessment of ecosystem services?

We are not aware of any such major project. However, some projects concerned with ecological functioning (few if any with ecosystem services) need identification of species, and taxonomists are somewhat involved in such projects.

2.2 What is the contribution of taxonomy in your country to the management of biological invasions?

Taxonomists have been involved to produce the Norwegian Black List of invasive species. The former Biodiversity Research Program at the Research Council of Norway has funded some projects, eg. on the invasion of macro-algae.

2.3 What is the contribution of taxonomy in your country to efforts to understand the status and trends of key functional groups such as pollinators?

Several projects on various aspects of pollination have been conducted but the contribution of taxonomists has been limited to a few cases of contributions with species identification.

### **Taxonomy, biodiversity and its conservation: "How to manage it in sustainable way?"**

Describe 1-2 flagship projects related to bullet points below and suggest some recommendations useful for meeting as a result from these projects:

2.4 Are there also non-professional organisations recording biodiversity data collections (e.g. ornithologists) involved in the decision process of land use planning etc.?

The Norwegian Biodiversity Network (SABIMA) is an umbrella NGO for ten Norwegian biological associations (NGOs). With more than 18,500 members, they embrace both professionals and most skilled amateur biologists in Norway. These associations cover the whole spectrum of plant and animal life, and conduct extensive volunteer biodiversity mapping to increase the knowledge base. Members of the Norwegian Ornithological Association are also involved in more organised bird monitoring activities as part of the national Terrestrial Ecosystems Monitoring Programme. However, the results from these activities will only indirectly have an influence on land use planning, especially where red-listed species have been recorded or where major species concentrations are found.

2.5 Are there some indicators (or red-list species) monitoring Natura 2000 sites for delimitation and management of nature reserves used in your country?

As Norway is not party to the Habitat Directive, there are no Natura 2000 sites and hence no monitoring of these. However, the occurrence of red-listed species and of concentrations of other species are often important indicators for identification and prioritisation of conservation areas.

2.6 Which taxonomy-related research (standardized taxonomic metadata, delivery of checklist building tools, building expertise network) in developmental non-European biodiversity-rich countries is supported by policy-makers from your country based on your national expertise and experience?

Very little. Some is funded by funding set up for capacity-building by Norwegian universities in developing countries (NUFU), e.g. in African countries. Norwegian development aid authorities have in general very limited interest in biodiversity-related topics.

2.7 Is there a National Needs Assessment of GTI in your country? If yes, what are your specific needs, e.g. for conservation, protected areas, CITES/customs, dealing with invasive species etc?

Not as far as we are aware.

### **3- Taxonomy, potential users and capacity building of experts**

#### **Open access to information: "How to find out about it?"**

*How does taxonomic information get from where it resides to where it is needed elsewhere in the world?*

- *Bioinformatics*

3.1 To what extent is taxonomic research in your country contributing to international biodiversity initiatives and projects (e.g GTI, GBIF, PESI, EOL, Etc...)

We substantially contribute to GBIF. About 3 million objects from 41 databases from 11 Norwegian institutions are contributed (see <http://norbif.uio.no:8080/gbifmeta.php>).

3.1 What is the state of the art in biodiversity informatics in your country? (e.g. e-taxonomy and e-science tools)

There is considerable information on species through web-based tools such as *Artsobservasjoner* (the public contributes observations of species occurrences), *Artskart* (distribution maps), and GBIF. See <http://www.artsobservasjoner.no/>, <http://artskart.artsdatabanken.no/Default.aspx>, <http://www.gbif.no/>

Searchable databases on red-listed and alien species is also available at The Norwegian Species Biodiversity Information website ([www.biodiversity.no](http://www.biodiversity.no)).

For molecular genetics and similar activities needing bioinformatics tools, the commonly used tools used internationally are available.

3.2 Has there been a national assessment of best practices for taxonomic data quality and validation?

No

3.3 Do you have any national guidelines on how to approach the proof of absence?

No.

3.4 What are the taxonomic standards used in the databases (TDWG, Darwin core, COL, PESI, etc...)?

There is no common standard, many are used. GBIF-Norway uses Darwin Core 2. A national register with scientific and common names for Norwegian species will be available from June 2009.

3.5 Could you identify the major digitization efforts for biodiversity data (e.g. collections, observations, species checklists, etc...)?

A lot of effort has resulted in some major collections being fully or partially digitized. Funding comes from Norwegian Biodiversity Information Centre, GBIF, Revita and other sources. More funding is needed to digitize all existing collections.

In cooperation with GBIF, the Norwegian Biodiversity Information Centre has introduced a map service on internet ([www.biodiversity.no](http://www.biodiversity.no)). The service *Artskart* (Species Maps) allows you to search databases located in 20 different scientific institutions, simultaneously. The databases so far contain data on 6 million species locations. A total

of 17 500 species are so far represented. More data will be added to the service in the years to come.

3.6 Is there any effort in your country to make taxonomic information especially identification services easily accessible and useful to practitioners

A validating service for species observations will be available in the next version of *Artsobservasjoner* (the Species gateway for field observations).

**Capacity building in biodiversity-rich countries and worldwide:**

3.7 Are there any policy initiatives in your country to orient capacity building in taxonomy?

Not at the moment, but this may change with implementation of the Norwegian Taxonomy Initiative, e.g. by establishment of a research school in biosystematics

3.8 Are there any sources of finance or policy actions in your country dedicated to applied taxonomy (e.g. identification tools, training for parataxonomists)?

No.