

## The needs for and availability of vegetation data for environmental policy making in Europe

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**ABSTRACT** – In field of environmental policy and nature conservation on a European level many international institutions collect, use and/or publish data about vegetation. In this article a number of these institutions are mentioned, and how they use or might use information about vegetation. After a description of the types of data, the needs are confronted with the present situation. It is concluded that a large part of the needs is not covered by the available information.

**KEY WORDS** - Vegetation, Europe, environmental policy, nature conservation, biotope, plant community, habitat.

### 1. INTERNATIONAL INSTITUTIONS AND FORUMS IN EUROPE

Many European institutions are one way or another involved in working with data on habitats, biotopes, ecosystems, vegetation, plant communities, and landscapes. In this article the differences between these types of data are more or less ignored. These organizations are occupied with development and standardization of methods (including classifications), collecting, analyzing and publishing of data, harmonization, standardization, environmental policy and nature conservation. The list of organizations mentioned below has not the pretension to be complete, but concentrates on the most important and well-known ones.

1. Two institutions of the European Union with 15 members: the European Environment Agency in Copenhagen with its European Topic Centre for Nature Conservation in Paris and Eurostat, Statistical Office European Communities in Luxembourg (Natura 2000 network);

2. The United Nations Economic Commission for Europe in Geneva with 51 European members and 4 members outside Europe with the Statistical Commission. The United Nations Environmental Program and United Nations Educational Scientific and Cultural Organization;

3. The Council of Europe with 33 members in Strassbourg;

4. The Organization for Economic Co-operation and Development in Paris with 18 European members and 7 members outside Europe;

5. The International Union for Conservation of Nature in Gland (Switzerland);
6. The World Wide Fund for Nature (European Office in Brussels);
7. The European Union for Coastal Conservation in Leyden;
8. The World Conservation Monitoring Centre in Cambridge;
9. The European Habitats Forum;
10. The European Conservation Institutes Research Network: Connect;
11. The International Association for Vegetation Science, and
12. The Working Group for the European Vegetation Survey in particular.

## 2. USE BY ENVIRONMENTAL POLICY

It is hardly possible to give an extensive list of how data about vegetation are and can be used by national and international organizations. For that reason only a few examples are given, covering several different subjects.

Protection of threatened wild species is a hot item in nature conservation. Protection of species is only possible in the wild when their habitats are protected. If the habitats needing protection are known the second step is to determine the areas where the habitats occur, and how they can be best preserved. Because vegetation forms an important part of the habitat of most species, knowledge about its occurrence and the biotic and abiotic factors that determine the occurrence of these types is needed. But also protection of plant communities of their own right can be a principal aim. Red data lists of plant communities can be useful tools for environmental policy.

Environmental data can only be understood in their geographic context. Environmental problems in mountainous areas are largely not the same as in river deltas. In order to understand these problems, and to know how to tackle them one needs data on «natural» areas often surpassing national borders. These data are also used for the policy on management of flora and fauna species, because different ecosystems support different animal and plant species. Protection of these species is based on knowledge of their occurrence and dynamics of populations in different habitats.

Data about vegetation can show the effects of human activities on nature. They can show how much of the natural plant cover has been changed by man into semi-natural or cultural vegetation types. These data not only can serve as a warning system but also as basic information source for spatial planning.

Last, but not least vegetation data on European scale are important as they make a comparison possible between data on a national and an international scale. For example making a red list of threatened plant communities in the Netherlands is of more significance regarding information about threats outside the Netherlands.

### 3. TYPES OF VEGETATION DATA

The vegetation data can be roughly divided into three categories beginning with the more basic work on classification (chapter 3.1) and gathering global information about vegetation types (chapter 3.2). More precise information can be derived from maps (chapter 3.3) with an emphasis on spatial aspects or from monitoring (chapter 3.4) with an emphasis on temporal aspects. Both on species as well as on community levels these types of information can be seen as logical steps in course of the time.

#### 3.1 *Classification*

First, before all other work can be done a classification of the vegetation has to be made. At a detailed level many national classifications already exist, some of them are now being recently revised (see activities of the European Vegetation Survey, Mucina *et al.* 1995). Also on a more global (i.e. World or European) scale many classifications are available (see chapter 5.1 on availability).

#### 3.2 *Characteristics of plant communities*

Besides the criteria used for classification (e.g. diagnostic species) and names of plant communities also descriptive information on distribution, rareness, threats, structure, succession, diversity, and nature management is of vital importance. Much information can also be derived from the characteristics of species making-up the community. Ecological and other characters (parameters) have to be extracted from the textual information for a more analytic and comparative use (compare Pahlsson, 1996).

#### 3.3 *Maps*

Instead of a verbal description more detailed information about the distribution can be made visible on maps showing the spatial occurrence of plant communities. One type of map shows the distribution for each individual plant community (Fig. 1), and another all plant communities of a certain area (Fig. 2).

#### 3.4 *Monitoring*

Policy making requires not only information about the spatial aspects but also about the temporal ones, because the decision making is also based on the changes occurring in the distribution and population size of selected plant and animal species. On a national scale most monitoring systems are based on systems that measure trends in population sizes. These systems mostly not measure quantity and/or quality of ecosystems.

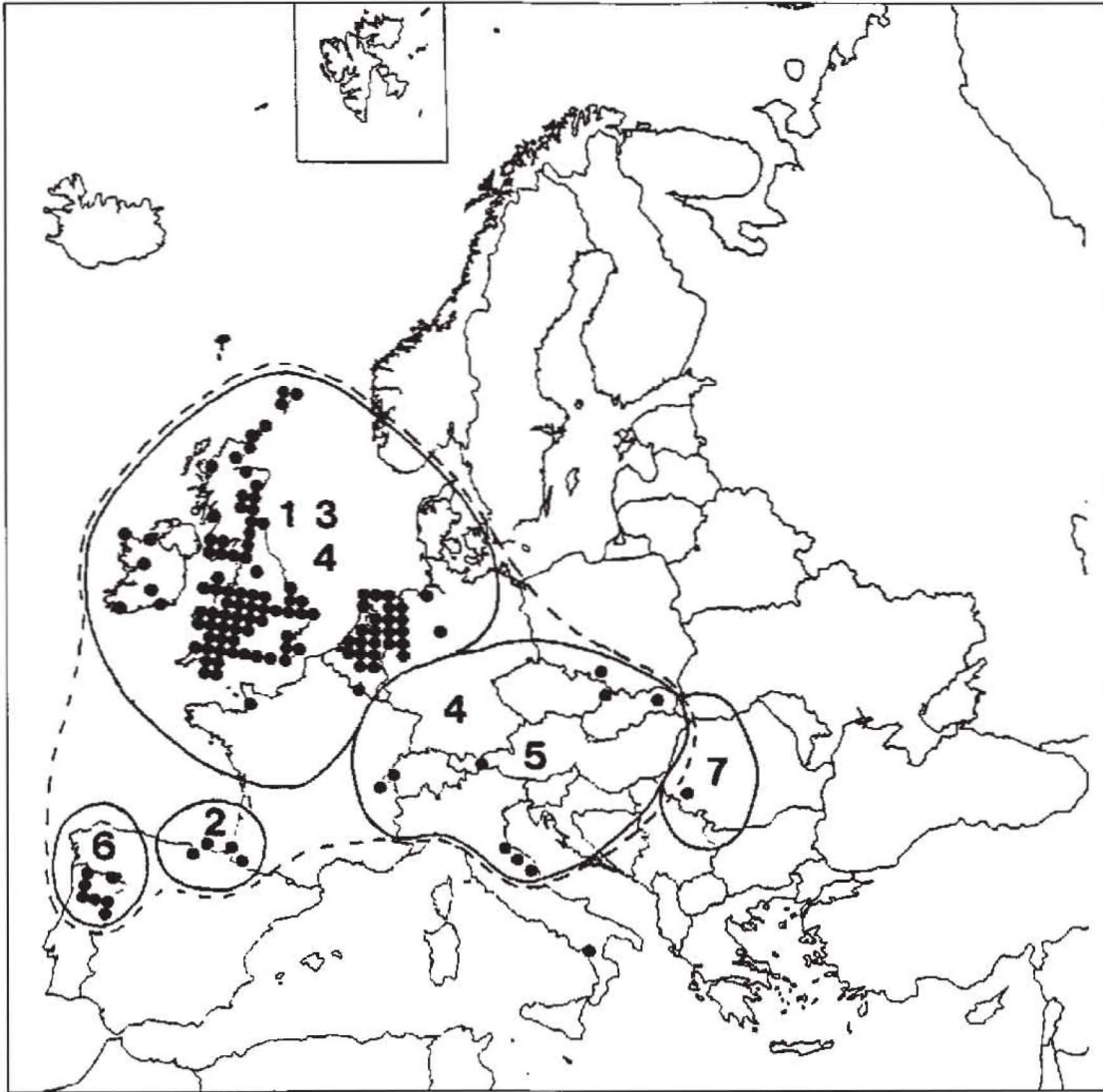


Fig. 1 – Map of the distribution of some plant communities in Europe (Cynosurian types).  
(Zuidhoff et al, 1995)

#### 4. REQUIREMENTS

The demands needed for classification of and maps on vegetation on a European level are discussed in the next two chapters.

##### 4.1 Classification

Classifications are supposed to cover the entire field of interest. Each element has to be placed within one of the classes of the classification. The different classes must be distinctive, no overlaps or gaps among them are allowed.

If a classification is based on two or more (types of) criteria, it is better to make a hierarchic one with for each level different types of criteria: more global criteria on higher levels and more detailed criteria on lower levels. For many classifications of vegetation the highest levels are based on the physiognomic characters of the vegetation itself, while on the lower levels they rely on floristic composition.

The classes of a classification must be well described. A (dichotomous) key accompanying a classification scheme is always of great help.

Most scientists use scientific names for the classes of the classification of vegetation but most policy makers like common (vernacular) names because it gives them more feeling with the subject. At least at medium and high levels common names should be added to the scientific names. So it is better to use «dry heathlands» in stead of «*Calluno-Ulicetea*» and «salt marshes» in stead of «*Asteretea tripolii*» for non-scientific purposes, such as policy-making. Still after having chosen a language for the common names, one is confronted with problems of translations, and very often common names do not match scientific names one-to-one.

## 4.2 Maps

Mapping of plant communities can be realized in many ways. Most often either one single community is mapped (Fig. 1) or a map carries all communities (at a given level of detail) within the area of interest (Fig. 2). A grid system is often used for flora and fauna atlases, where the presence of a species is recorded for each «square» of the grid. This type of map is usually less accurate than maps that make use of borders of natural units. For mapping of individual plant communities this method can also be used (Fig. 1), however this method is not appropriate for mapping all plant communities on one map.

Many published maps of European vegetation are restricted to certain administrative or political regions. For policy on nature management this division of Europe has to be avoided. A map that covers the whole of Europe will be more convenient because of the convergence in environmental policy making in all parts of Europe.

The choice between a map with the actual or potential natural vegetation is a rather difficult one. Maps with the potential natural vegetation illustrate the distribution of dominant natural plant communities and their complexes which have adapted to existing climatic and edaphic conditions. The making of such a map for the whole of Europe is a difficult and time-consuming job (Bohn, 1994).

The maps of potential natural vegetation do not show the influence of man on vegetation. Especially in urban and agricultural areas hardly anything of the natural (climax) vegetation has been left. Knowledge about the present situation is needed for a lot of purposes, but the making of such a map of Europe will be

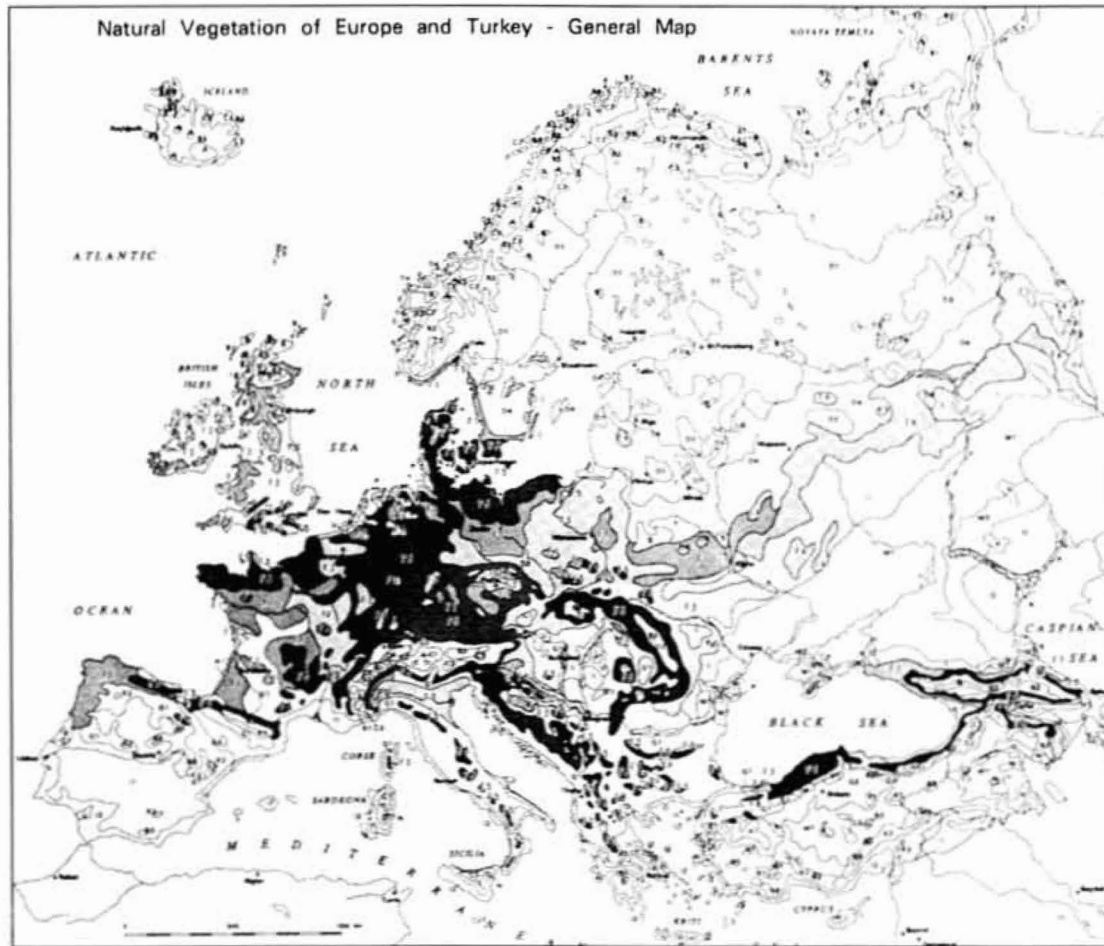


Fig. 2 – Map of the natural vegetation of Europe.  
(Bohn, 1994, page 43)

more complex than the potential vegetation map. Perhaps at first maps from other sources like land-use maps or maps based on remote sensing in combination with potential natural vegetation maps can give useful information.

The recommended scale for European vegetation maps ranges between 1:2 000 000 and 1:3 000 000. Of course more global and simplified maps can be derived as well.

Such maps of potential and actual maps can only reproduce the vegetation types of the higher levels of the vegetation classification, more or less comparable with types of landscapes. Next to printed maps more and more maps stored as a digitized map in a Geographical Information System are used. These systems allow combining two or more maps into a new map and more advanced analyses. The usefulness of these systems however largely depends on the characteristics of the used maps regarding scale, measure of details, projection or grid-systems etc.

## 5. AVAILABILITY

### 5.1 *Classifications*

On a world or European scale there are many classifications of vegetation available, some examples can be found in the list of references like in the ones of UNESCO (1973, 1988), Schmithsen (1961), Council of Europe (1987), Devillers *et al.*, (1993), IUCN (1973) and the Commission of the European Communities (1991). The latter organization has published a classification of the habitats of the European community (CORINE), which undergoes further development. It is not the purpose of this article to give an extensive overview of all available classifications and its characteristics. Still a quick look at all named sources shows that none would fulfill all requirements listed above (chapter 4). Most conspicuous is the lack of good documentation. Not one is documented well enough to relate to information on a national scale.

### 5.2 *Maps*

Published maps of individual plant communities that have published, are scattered over a large number of publications. The assumption is that only a minor part of the areas of plant communities has been mapped. On a national scale only Switzerland has published an atlas with a selected group of individual plant communities. In the Netherlands a project on mapping of all plant communities on the level of associations has been started recently (Van Duuren *et al.*, 1992).

A few maps of the vegetation of Europe are available (Council of Europe, 1987) and a new one will be published within a short time (see Bohn, 1994; 1995). As long as most countries use their own classification and no information about the occurrence of plant communities in their country exists this information can only be derived from more global information sources like remote sensing.

## 6. CONCLUSION

There is a big gap between the availability of and demands for summarized data on vegetation of Europe. International political organizations such as the United Nations and the European Union should play a role in bridging this gap. The role of (vegetation) scientists in different countries plays an important part in providing the information required, especially where they cooperate on an European scale. The activities of the Working Group «European Vegetation Survey» of the International Association for Vegetation Science I.A.V.S. should get a special mention in this field of interest.

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