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POLISH SCIENTIFIC PROJECTS SERVING PLANT BIODIVERSITY CONSERVATION – NATIONAL AND EUROPEAN PERSPECTIVE

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Due to various reasons biodiversity has recently become a key category organizing our thinking about nature conservation. Among various projects devoted to plant biodiversity some are of special importance, as they cover the whole country and participate in the international cooperation. Five of them, which are realized by two institutes of Polish Academy of Sciences in Cracow are briefly characterized below.

• NATURA 2000 in Poland

"NATURA 2000" is a Pan-European project aiming at creating a network of areas protecting most important part of European biodiversity. Two main criteria are used to distinguish areas to be included into the network:

– vegetation (plant species and habitats, as listed in Bern Convention and Habitat Directive)
– birds (according to Birds Directive; based on "Birdlife International" – supervised project – that resulted in establishment of Important Bird Areas – IBA).

The project in Poland is supervised by the Ministry of Environment. Main participant are:

– GRID, Warsaw
– Institute of Nature Conservation Polish Academy of Sciences in Cracow
– regional advisors from almost all scientific centres in Poland.

Project which was started in relation with Polish accession to European Union is already finished and final proposal is submitted to Brussels. As the project is widely known and its main idea was presented several times in various form also in Poland (see Fig. 1), thus is not worthy to give a wider comments on it.

• IMPORTANT PLANTS AREAS (IPA) – on this stage this Pan-European project is covering several Central-Eastern European countries (Fig. 2) including Poland. In our country the project is coordinated by the Institute of Botany Polish Academy of Sciences in Cracow. The aim of the Important Plant Areas (IPA) programme is to identify and protect a network of the best sites for plant conservation throughout Europe and the rest of the world, using consistent criteria. Project is analogous to the IBA network project concerning birds, and is conducted under supervision of Planta Europa and Plant Life International, with a financial support of the Dutch Government. Its aim is to preserve the most important sites of the vegetation cover (incl. both species and habitats) in the European scale.

Three groups of criteria are used to identify IPA sites:

– criterion A (presence of rare, endemic, relic and endangered species) – the site holds significant population of one or more species that are essential for global or at least European plant conservation;

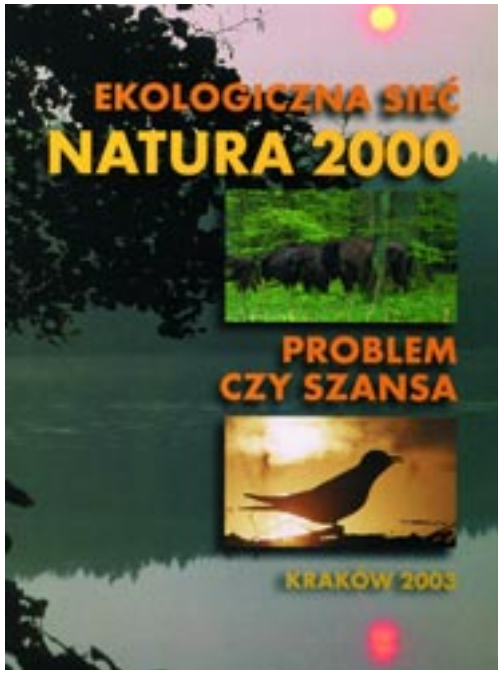

Fig. 1. Polish manual devoted to NATURA 2000 network.

Fig. 2. Central-Eastern European countries participating in project "Important Plant Areas".

– criterion B (presence of exceptionally species-rich examples of typical habitats) – the site has an exceptionally rich flora in an European context in relation to its biogeographic zone;
– criterion C (presence of endangered habitats) – the site is an outstanding example of a habitat type of global or European plant conservation and botanical importance.

Internationally accepted *"Site Selection Manual"* (Fig. 3) is a good tool allowing to use the same criteria in similar way in various countries. The most important characteristics of the project are:
– stage-wise realization process (regarding European and national level)
– 3-year component projects encompass successive parts of the continent
– final national and regional reports feature open lists of the sites included into the network at the respective stage
– conclusion of the first-stage project includes organizational and merit preparation for the continuation of the whole process.

Several differences can be found when comparing IPA with NATURA 2000:
– only plant-related criteria (analogously to the birds in IBA) are considered

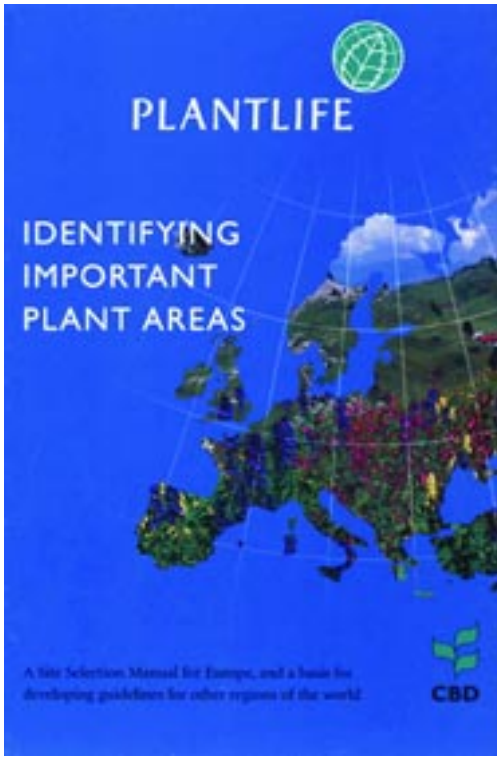

Fig. 3. IPA *"Site Selection Manual"*.

– additional criteria enabling region-oriented (not only globally – or continentally-oriented) site identification are used
– all groups of plants and fungi are taken into account
– IPA project is independent of administrative-political factors in the process of establishing sites (this dependence considerably and adversely influenced the NATURA 2000 network completeness, that in effect rendered it much insufficient to the demands of nature preservation in the continental scale). In the first stage of the project which is just being finished, 116 sites have been selected (Fig. 4). Final publication is expected in 2005.

• **LACOPE** (Landscape Development, Biodiversity and Co-operative Livestock System in Europe – EU 5th Framework Programme) is a Pan-European project coordinated by Stuttgart University. Poland represented by the Institute of Botany Polish Academy of Sciences in Cracow is one of seven countries (Fig. 5) participating in its

Fig. 5. Countries participating in LACOPE project.

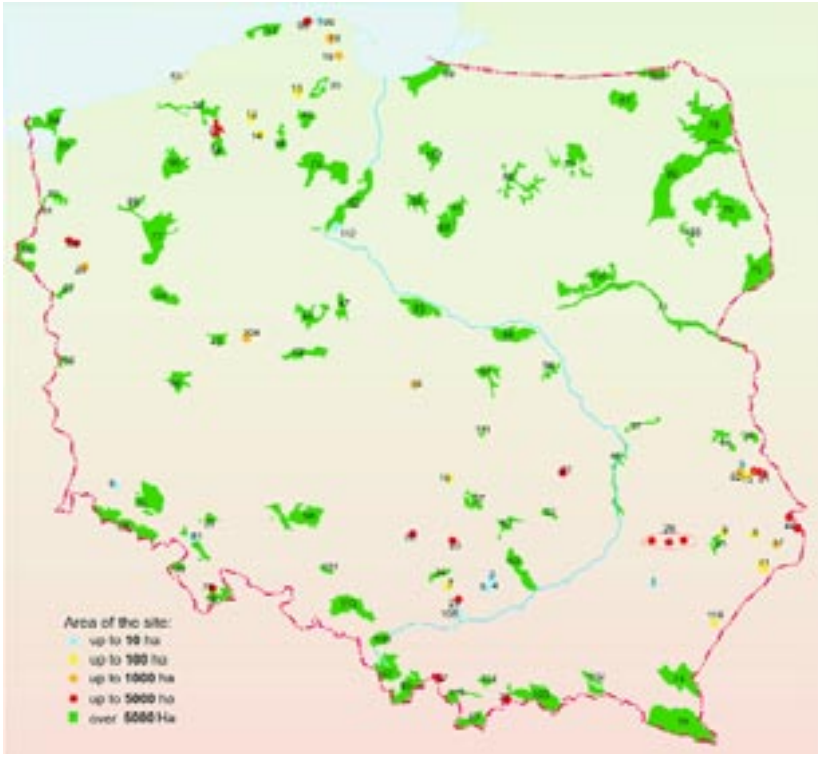

Fig. 4. Distribution of IPA sites in Poland.

realization. Since large sector efforts in nature conservation have not stopped biodiversity losses in Europe's open and semi-open landscapes, management methods have to be improved. Large-scale grazing systems were the important driving force creating open habitats, that are irreplaceable for many plant and animal species, including those which are core targets of the European NATURA 2000 system. The project objectives are: (i) the identification of Co-operative Livestock Systems (CLS) that create and support important FFH habitats and areas, large enough to ensure survival of viable populations of endangered species, (ii) the optimalisation of CLS as ecologically and economically sustainable tools to foster old and create new open/semi-open habitats, specific ecotones and to maintain landscape dynamics, according to biodiversity protection goals; (iii) goal-oriented use of the potential of CLS to match strategies in nature conservation (NATURA 2000) and agri-environmental policies in extending EU.

The main part of the ecological research include assessment of biodiversity of natural and semi-natural grazing-related areas in chosen regions, by means of: (i) vegetation and habitat type mapping, (ii) local biodiversity sampling of areas of different degree of pastoral use and (iii) habitat-suitability characteristics using indicator species from chosen groups of organisms (vascular plants, lichens, bryophytes, ground beetles, butterflies, birds) as so-called *"Target Species"*.

• **INTRABIODIV** (EU 6th Framework Programme) is devoted to biodiversity of high mountain flora and vegetation of Central Europe. General idea of the project is tracking surrogates (indicators) for intraspecific biodiversity assessment: towards efficient selection strategies for the conservation of natural genetic resources using comparative mapping and modelling approaches. Three basic levels: intraspecific, interspecific and environmental (habitat) ones, and their comparative analysis are used in order to find potential relationships between them. The high-mountain flora of the Alps and the Carpathians is used as a well-delimitated model. The project is coordinated by Laboratoire d'Ecologie Alpine, Université Joseph-Fourier, Grenoble, France, and the Institute of Botany PAS takes part in it as one of 16 main contractors (Fig. 6) and one of 4 main laboratories responsible for molecular analyses.

Species richness is the most widely used measure for biodiversity assessment. However, it is intraspecific diversity (genetic polymorphism) that represents the evolutionary and adaptive potential of each species. In this project, main objectives are: (i) to find and explain possible relationships among inter- and intraspecific plant diversity and habitat variation, (ii) to elaborate a model approach to predict intraspecific plant diversity, using more efficiently accessible surrogates, on a large scale, and (iii) to establish tools for the design of a network of protected areas for

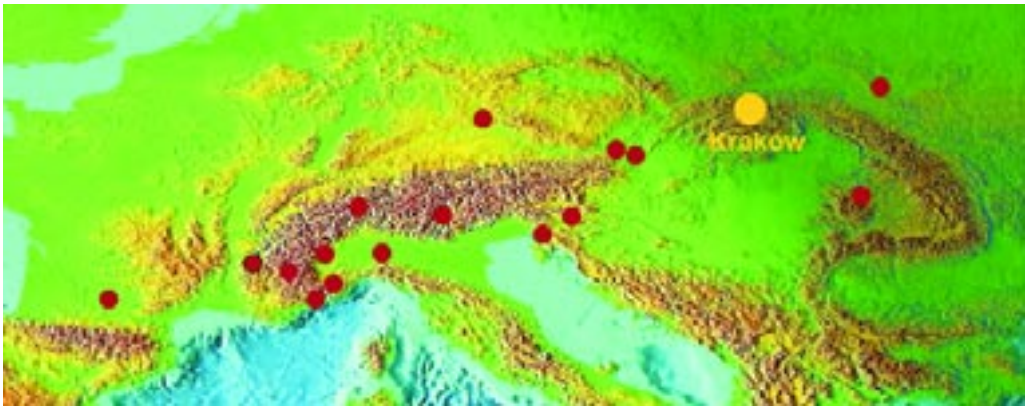

Fig. 6. Main contractors of INTRABIODIV project.

effective ensuring the sustainable management of natural genetic resources.

The following questions will be asked, using the Alps and the Carpathians as model systems: (i) is there a congruence between intra- and interspecific biodiversity? (ii) do areas of high endemism, often coinciding with glacial refugia, harbour a great degree of intraspecific diversity? (iii) is habitat variation, characterized by environmental parameters, a good surrogate (indicator) for intra- and interspecific diversity?

In order to accomplish these aims, the intraspecific diversity will be estimated by using molecular markers in 25 model species, the species richness will be mapped on the same area using mainly existing data on plant distribution, and environmental data will be compiled to produce a map of habitat diversity. All these maps will be compared in order to find possible correlations among these variables and as a result the areas comprising the highest proportion of both intra- and interspecific diversity will be recognized. This integrative approach will result in modifying till now existing network of protected areas in Alpine and Carpathian massifs, and will help in more rational managing of biodiversity. A web-based public platform will be developed to present current and final results of the project.

• **INVASIVE ALIEN SPECIES IN THE FLORA OF POLAND** (POLISH COMMITTEE FOR SCIENTIFIC RESEARCH Project no 2P04G 076 26p02)

Analysis of invasiveness of alien plants and fungi is essential to reveal threats for a native biodiversity. Attempt to recognize present patterns of distribution and phytocenological status of invasive species in the flora of Poland is a subject of an all-country project (involving 7 academic centres) started this year and coordinated by the Institute of Botany PAS in Cracow. The project is supported by the State Committee for Scientific Research. Ecology of invasive species as well as rates and ways of invasion will be studied. A list of protected areas and biotopes sensitive to invasion (especially biotopes listed in "Habitat Directive") will be established. Mechanisms of incorporation of alien species into native plant communities and influence of this process on native biodiversity at biocenotic and landscape levels are also a subject of the research. Role of hybridisation between native and alien species in contamination of native gene pools is another topic of the project. Among the final results, "Polish Book of Invasive Species" containing small monographs of over 150 invasive aliens (plants and fungi), is expected to be published.