

# NATIONAL BIODIVERSITY STRATEGY OF THE CZECH REPUBLIC



Ministry of the Environment of the Czech Republic  
2005



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THE GOVERNMENT OF THE CZECH REPUBLIC



RESOLUTION OF THE GOVERNMENT OF THE CZECH REPUBLIC  
OF MAY 25, 2005 NO. 620

**ON THE NATIONAL BIODIVERSITY STRATEGY OF THE CZECH REPUBLIC**

The Government

I. Approves the National Biodiversity Strategy of the Czech Republic, contained in Part III of the material - Ref. No. 710/05, which is required as a part of implementation of article No. 6 of the Convention on Biological Diversity (hereinafter referred to as "Strategy");

II. Requires that:

1. the Minister of the Environment in cooperation with the Minister of Agriculture

- a) prepares the Action Plans of the Strategy by May 25, 2008,
- b) elaborates a system of implementation indicators evaluating progress in fulfilling the Strategy goals and an Assessment schedule of reaching the Strategy goals,
- c) ensures continuous information campaign and presentation of the importance of biological diversity and sustainable use of its components,
- d) updates Strategy after 10 years of its validity,
- e) submits to the Government the assessment of the Strategy and fulfilling its goals in accordance with point II/2 of this Resolution by December 31, 2015,

2. the Deputy Prime Minister and Minister of Transport, Ministers of the Environment, Agriculture, Foreign Affairs, Regional Development, Industry and Trade, Informatics and of Education, Youth and Sports - take into consideration goals of the Strategy in all programme and sectoral materials, policies, strategies, concepts and legal enactments.

To be implemented by:

the Deputy Prime Minister and Minister of Transport,  
Ministers of the Environment, Agriculture, Foreign Affairs, Regional Development, Transport and Trade,  
Informatics, and of Education, Youth and Sports

Prime Minister  
Ing. Jiří P a r o u b e k

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### **Coordination team:**

Mgr. Jana Brožová, ME  
Mgr. Jindřiška Staňková, ANCLP CR  
Mgr. David Vačkář, ANCLP CR

### **Chapter Authors:**

Mgr. Lucie Brejšková, Mgr. Tomáš Černý, Mgr. Bohumil Fišer, Ing. Václav Hlaváč, RNDr. Štěpán Hřebík, Ing. Karel Jech, Prof. RNDr. Pavel Kovář, CSc., Mgr. Martin Křivánek, Mgr. Peter Mackovčín, Ing. Věra Mátlová, Mgr. Josef Novák, Ing. Martina Pásková, Ph.D., RNDr. Jan Plesník, CSc., RNDr. Jan Pretel, CSc., Mgr. Kateřina Scharffová, RNDr. Zdeněk Soldán, CSc., Mgr. Jindřiška Staňková, Ing. Dalibor Stráský, Mgr. Václav Tremel, Ing. Pavel Unar, Mgr. David Vačkář

### **Chapter Consultants:**

RNDr. Petr Anděl, CSc., Mgr. Marek Banaš, Prof. RNDr. Vladimír Bejček, CSc., RNDr. Petr Blahník, RNDr. Alena Blažková, CSc., Ing. Radomír Bocek, RNDr. Magdalena Boučková, Ing. Jiří Brázda, Ing. Vladimír Brenner, RNDr. Martin Čihař, CSc., Ing. Ladislav Dotlačil, CSc., Ing. Tomáš Doucha, RNDr. Jiří Flousek, Dr., Ing. Mgr. Eva Havlínová, Mgr. Michal Hejzman, Ing. Vojtěch Holubec, CSc., RNDr. Ladislav Homolka, CSc., Ing. Karel Horníček, Mgr. Michael Hošek, Ing. Jiří Hradec, RNDr. Štěpán Husák, CSc., Mgr. Zdeněk Chrudina, Ing. Jozef Jančo, Ing. Daniel Janouš, CSc., Doc. RNDr. Jana Kalvová, CSc., RNDr. Jan Kirschner, CSc., RNDr. Alexandra Klaudisová, RNDr. Jiří Kolbek, CSc., Prof. RNDr. Pavel Kovář, CSc., Mgr. Tomáš Kučera, Dr., Doc. Ing. Ivo Kupka, RNDr. Evžen Kůs, Mgr. Radka Kvasničková, Ph.D., RNDr. Jan Květ, CSc., Ing. Darek Lacina, Ing. Petr Lepeška, Ing. Miloš Lukášek, Mgr. Pavel Marhoul, RNDr. Jana Malá, RNDr. Miroslav Martiš, CSc., Doc. RNDr. Josef Matěna, CSc., RNDr. Ladislav Miko, Ph.D., RNDr. Petr Musil, CSc., RNDr. Miloš Němec, CSc., Ing. Jarmila Ottová, Ing. Jan Penk, RNDr. Zdena Podhajská, RNDr. Jan Pokorný, CSc., Ing. Jaroslav Pražan, Ing. Jan Procházka, RNDr. Petr Pyšek, CSc., Ing. Petr Ráb, DrSc., Ing. David Rešl, RNDr. Petr Roth, CSc., Ing. Milena Roudná, CSc., Mgr. Vlastik Rybka, Ph.D., Mgr. Tomáš Růžička, RNDr. Radko Samek, Ing. Ladislav Silovský, Mgr. Ondřej Šimon, Doc. Ing. Josef Seják, CSc., Ing. Stanislav Sládek, Mgr. Ondřej Slavík, Ph.D., Prof. RNDr. Tomáš Soldán, DrSc., RNDr. Zdeněk Stehno, CSc., Doc. RNDr. Karel Spitzer, CSc., RNDr. Jiří Šafář, Mgr. Milan Ščasný, Ing. Jan Šíma, Ing. Karel Jan Štolc, CSc., RNDr. Jan Štursa, CSc., Ing. Jan Ulrich, Mgr. Dušan Vácha, Mgr. Libuše Vlasáková, Ing. Bohuslav Vínš, CSc., Ing. Mgr. Lenka Vokasová, RNDr. Josef Vopálka, Mgr. Petr Voříšek, Dr. Mgr. Ondřej Wagner, Doc. RNDr. Světlana Zahradková, Ing. Václav Zámečník, RNDr. Irena Zbytovská, Doc. RNDr. Josef Zelenka, Ing. Jan Zohorna, RNDr. Jiří Žalman, Doc. Ing. Zdeněk Žalud, Ph. D.

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## I. Terms of Reference

The National Biodiversity Strategy of the Czech Republic (hereinafter the “Strategy”) was formulated shortly after the accession of the Czech Republic (CR) to the European Union (EU). This is the first document that outlines the further biodiversity conservation and management in the country. The Strategy has been submitted for approval to the Government of the CR as a task in the non-legislative plan of work of the Government for 2005. It is based on the Convention on Biological Diversity (hereinafter the “Convention”, “CBD”), which was open for the signature at the UN Conference on Environment and Development (UNCED, “Earth Summit”) in Rio de Janeiro in June 1992. It came into force for the CR on March 3, 1994. The Convention is considered globally to be a key document in the conservation of biological diversity (biodiversity) at all three levels (genetic, species and ecosystem).

The very definition of the Convention’s objectives indicates a clear direction, although a very broad one. The Contracting Parties to the Convention pledged to implement the three objectives of the Convention, consisting in:

- 1. conservation of biological diversity**
- 2. sustainable use of components of biological diversity**
- 3. fair and equitable sharing of the benefits arising out of the utilization of genetic resources.**

In order for the Contracting Parties to the Convention to be capable of implementing these objectives, pursuant to the Article 6, in accordance with their particular conditions and capabilities, they are to develop national strategies, plans and programmes for the conservation of biological diversity and sustainable use of its components or adapt existing strategies, plans or programmes for this purpose. These should reflect, *inter alia*, the measures set forth in this Convention and relevant to the particular Contracting Party and also integrate, as far as possible and as appropriate, the conservation of biological diversity and sustainable use of its components into the relevant sectoral or cross-sectoral plans, programmes and policies.

The Strategy is a fundamental document that is based on the related activities of the Convention, *i.e.* the thematic programmes of work, proposed by the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA), which are then approved by the Conference of the Parties (COP). The individual thematic programmes of work of the COP should, within the capabilities of each country, be included in national biodiversity strategies and subsequently incorporated and elaborated in action plans. The Strategy accepts the thematic programmes of work and suitably modifies the objectives set forth in them on the basis of the current conditions and capabilities in the CR.

## II. Challenge

The internationally agreed objective of halting or at least substantially reducing the rate of the loss of biodiversity by 2010 is the subject of several international and European agreements. In the framework of the EU, the need to halt the loss of biodiversity and include this in the EU Strategy for Sustainable Development was first emphasized at the Gothenburg Summit in 2001. The 6<sup>th</sup> Environment Action Programme of the European Community (July 2002) also includes the above requirement at both an European and an international level. A common position of Ministers of the Environment was adopted at the Fifth Ministerial Conference of the UN Economic Commission for Europe (ECE) in Kiev in May 2003, in which they pledged to halt the biodiversity loss in the ECE region by 2010. At the global level, Decision VI/26 was adopted at the sixth meeting of the Conference of the Parties to the Convention (2002). The alarming state of biodiversity was in this decision evaluated and Parties commit themselves to a more effective and coherent implementation of the three objectives of the Convention to achieve by 2010 significant reduction of the current loss of biodiversity at global, regional and national level as a contribution to poverty alleviation and to the benefit off all life on earth. The related World Summit on Sustainable Development (WSSD, 2002) again emphasized the objective to substantially reduce the current loss in biodiversity by 2010 and considered CBD as the key instrument for achieving the “**2010 Target**” on the global scale. **Consequently, all of the objectives of the Strategy are directed towards achieving this target, as agreed by the representatives of the individual countries.**

## III. Conference of the Parties (COP) and Convention on Biological Diversity (CBD)

At each meeting, COP discusses in detail certain biological aspects or main ecosystem types or specific provisions of the Convention. At the present, there are seven thematic programmes of work for the main ecosystem types (forest biodiversity; marine and coastal biodiversity; agricultural biodiversity; inland water biodiversity, dry and sub-humid lands biodiversity; mountain biodiversity and, finally, island biodiversity). In addition to them, 19 cross-cutting issues have been established in the Convention's framework and should be reflected in all thematic programmes of work. They include, *e.g.*, access to genetic resources, ecosystem approach, protected areas, invasive alien species.

Therefore, it is apparent that even countries with substantial capacities, either financial or other, and with traditional strong support from the general public in environmental protection and management, can not implement all the CBD's decisions, but must rather identify priorities among them and obtain the necessary political support for this. The **National Biodiversity Strategy** and the related, more detailed **Action Plans**, elaborating the strategic objectives into specific measures, should serve this purpose.

Since 1997, the Czech Committee for the Convention on Biological Diversity, consisting of representatives of the various sectors, the Academy of Sciences of the CR and NGOs, has assists in the CBD's implementation and coordination of all the stakeholders in the CBD's implementation in the CR. The Scientific Board was also established to deal with expert and technical issues. The Committee, together with the Board, acts as a supervising body for the Strategy.

Following the accession of the CR to the European Union, there was a change in the conditions related to fulfilling obligations following from the Convention. In addition to the priorities of the individual EU Member States as the Contracting Parties to the Convention, joint priorities have been agreed, following from the fact that the European Communities (EC) are also a Contracting Party to CBD. In addition, the document reflects the new legislation in

accordance with EC law and new on-going programmes and also takes into account international activities and agreements, is based on recommendations adopted at COP and emphasizes conservation of ecosystems and biodiversity as a whole. The approach reflects realistic, specifically defined objectives and is based on the current state of affairs and local conditions in the CR.

#### IV. Procedures and Objectives

The National Biodiversity Strategy of the Czech Republic has been prepared according to the structure and in accordance with the EC Strategy. The division of the individual chapters into strategic themes (ecosystem approach; *in-situ* conservation, *ex-situ* conservation; sustainable use; *etc.*) and biodiversity into sectoral policies (agriculture, forest ecosystems, water and wetland ecosystems, *etc.*) is maintained. The individual chapters are always adapted to the specific conditions in the CR. Implementation of the Strategy can substantially contribute to achieving the objectives set out in the Sustainable Development Strategy of the Czech Republic in December 2004.

All the individual steps that CBD requires (CBD, 2001) were included in preparing the Strategy:

- **Establishing an institutional framework for preparing the Strategy, including appointing a senior officer.** The Strategy was prepared by the Department for the International Conservation of Biodiversity of the Ministry of the Environment in cooperation with the Ministry of Agriculture (MA). The responsible persons were Jana Brožová, MSc. at ME and Jiří Stehlík, Dipl. Techn. at MA.
- **Fundraising for the process.** Funds were allocated from special subsidies for implementation of international conventions at ME. They were used primarily as fees for the individual authors and consultants for the chapters, working outside of the sector of the environment, and for promotional and public awareness activities related to the Strategy.
- **Evaluation of the state of biodiversity in the framework of the competence of the State** was based both on conceptual materials from the individual sectors (the most important are the State Nature Conservation and Landscape Protection Programme of the Czech Republic and the State Environmental Policy of the Czech Republic) and also on the experience and knowledge of the individual authors.
- **Formulation and discussion of the objectives of the Strategy through dialogue at a national level with the corresponding partners.** Meetings of the working groups were held during the preparation of the Strategy, to which consultants for the individual chapters and also representatives of the private sector were invited. Two meetings were also held of the Czech Committee for the Convention on Biological Diversity and with NGOs; the chapters were sent for consultation to experts at scientific institutions.
- **Comparison of current conditions with the general and individual objectives** was carried out individually for each chapter.
- **Formulation of steps that include specified key aspects and drawing up criteria and priorities for facilitation of the choice among various alternatives and scenarios** was the subject of consultations of the drafting party with the authors of the individual chapters, which took place throughout the preparation of the Strategy.
- **The assignment of actions to general objectives** will be the further process of formulating individual biodiversity conservation action plans.

The Strategy contributes to a pro-active approach for nature conservation, where an isolated **protection** approach excluding human activity in nature conservation is no longer employed and emphasis is placed rather

on a pro-active approach for nature **conservation**, with participation of human in these processes, requiring active involvement in nature management.

The Strategy attempts to be a comprehensive, structured and multi-disciplinary document. Consequently, the text includes references to the individual chapters (both in strategic themes and in the second part – biodiversity in the sectoral policies) and also references to the individual Decisions of the Conference of the Parties of CBD, in the form, *e.g.*, Decision VII/24, indicating that Decision No. 24 was adopted at the seventh meeting of the Conference of the Parties, and deals with education and public awareness. In addition to these references, each chapter includes a comprehensive table with a list of related documents. As an integral part, the Strategy also presents a dictionary of the used terms and abbreviations.

The main objective of the Strategy is to create a document for biodiversity conservation in the CR that will be both intersectoral and interdisciplinary. All parts of the document were prepared by and consulted with experts in organizations under other Ministries, sectors, *etc.*, scientific and research institutions, universities and with key partners, and, last but not least, a viewpoint on the document was also provided by non-governmental organizations. In the Strategy's drafting, for which working groups were established, headed by the chief coordinators, the authors and the drafting parties based their work on the main conceptual and policy materials on nature conservation in the CR, such as the State Environmental Policy of the Czech Republic (SEP) and the State Nature Conservation and Landscape Protection Programme of the Czech Republic (SNCLPP CR), and on the legally binding regulations for nature conservation and landscape protection. The relevant policy materials and legally binding regulations, which are cited in the particular chapter, were used as basic background materials in each individual chapter, on both strategic themes and sectoral policies.

## V. The Financial Impact on the Individual Types of Public Budgets and on the Business

The Strategy, in itself, does not encompass any additional financial requirements on public budgets. It will primarily lead to consistent implementation of the applicable legislation and already approved policies. It will also lead to the preparation of new legislation, outlined in the Strategy, in the framework of which the actual quantification of impacts will be carried out in accordance with the legislative rules.

Any financial impact of the individual Strategy's objectives will be taken into consideration during the preparation of the individual Action Plans, which will again have to undergo an approval process according to the Rules of Procedure of the Government.

The Strategy does not encompass direct implementation of instruments in the area of income taxes.



## A) STRATEGIC THEMES

**In-situ biodiversity conservation** - is concerned with conservation of ecosystems, natural habitats, including maintenance and recovery of viable wildlife populations in their natural habitats. The main approach for maintaining and increasing the number of species (species richness) consists in habitat and ecosystem management and the establishing suitable conditions for their further existence.

**Invasive alien species** - this chapter emphasizes the precautionary approach as the main approach towards management, control and eradication of the above species. It is concerned with the current state of plant and animal invasion, including activities to date to mitigate the detrimental impact of invasion in the CR. It is pointed out that it is important to inform the public of the risks represented by biological invasions.

**Ex-situ biodiversity conservation** - as a whole, is concerned with the aspect of conservation of the components of biodiversity outside of their natural habitats. It includes particularly species protection in zoological and botanical gardens, arboreturns and gene banks and is concerned with the aspect of species survival/recovery programmes for wild plants and animals in the CR.

**Gene banks** - this chapter is concerned with facilities and systematic measures employed to maintain the genetic diversity of living organisms in the form of seeds, pollen, embryos, cryogenic or *in vitro* cultures or (for field gene banks) in the form of living plants. Emphasis is placed on genetic resources of farm animals, micro-organisms and small animals of economic importance and other genetic resources.

**Sustainable use** - this chapter is concerned with the aspect of use of the components of biodiversity in a manner and to a degree that does not lead to the long-term decline. This maintains their potential to meet the needs and aspirations of present and future generations. This aspect is also the second main objective of CBD. It emphasizes the need for adaptive management.

### **Access to genetic resources and sharing of the benefits arising out of them**

**(Access and Benefit Sharing)** - related to the corresponding transfer and exchange of the relevant technologies, while taking into account all the rights to these resources and technologies; this is the third main objective of CBD. In the Czech Republic, this access is implemented, *e.g.*, through the National Programme of Conservation of Genetic Resources of Plants, Animals and Micro-organisms Significant for Nutrition, Agriculture and Forest Management and is also related to wild flora and fauna.

**Ecosystem approach as the leading principle in ecosystem management** - is integrated management of land, water and living resources, that promotes their conservation and sustainable use in an equitable way. This is based on the application of appropriate scientific methodologies focused on levels of biological organisation, which encompass the essential structure, processes, functions and interactions between organisms and their environment and recognizes that human beings, with their cultural diversity, are an integral component of many ecosystems. CBD defines this in terms of the 12 "Malawi Principles".

**CR case study - unreclaimed areas** - is concerned with the large number of anthropogenically affected, small, isolated and fragmented patches and also with large areas that were formed as a consequence of man's high requirements on a multifunctional landscape, for which an ecosystem approach must be employed in studying natural and unreclaimed areas. Emphasis is placed on long-term research and monitoring of the areas, in an attempt to find the best means of incorporating these areas back into the landscape.

**Biodiversity identification and monitoring** - according to this chapter, the purpose of identification and monitoring of biological diversity consists in observation of changes in its components and obtaining basic information for evaluation of measures and interventions adopted in the framework of various policies. Indicators are considered to be instruments summarizing comprehensive information on the general state and trends in biodiversity, providing a framework for monitoring the objectives of the Convention and changes and trends in the components of biodiversity.

**Biodiversity research strategy** - this chapter is concerned with research that contributes to the conservation and sustainable use of the components of biodiversity. Although biodiversity research has been constantly developing, it is necessary to improve its scientific background and support. The current interconnection between biodiversity research, the development of appropriate technologies (incl. methods and tools of conservation and sustainable use of biological resources) and practical management in the landscape has not been sufficient enough.

**Information exchange** - is concerned with informing the public of the state of biodiversity and with the availability of this information as an essential precondition for biodiversity awareness raising. This chapter deals with the information system for the Convention on Biological Diversity, which is a key instrument for implementing the Article 17 of the CBD.

**Communication, education and public awareness** - is concerned with the aspect of support for and encouragement of understanding of the importance of biodiversity conservation and sustainable use. The mass media and support for inclusion of these subjects in educational, public relation and communication programmes and in consulting are important aspects of the process.

**Biodiversity and the economy** - this chapter is concerned with this subject in accordance with the Article 11 of the CBD. It outlines instruments of positive stimulation, *i.e.* incentives (subsidies, support, exemptions, etc.) and instruments of negative stimulation (taxes, fees, sanctions) and market conformable instruments.

## B) BIODIVERSITY IN SECTORAL POLICIES

**Agriculturally managed ecosystems** - include important components of biological diversity that are important in providing foodstuffs as well as raw material resources for technical purposes, ecosystem functioning and safe life. On the other hand, agriculture is responsible for large-scale habitat destruction and loss. Thus, sustainable use is a necessary basis for biodiversity conservation in agricultural ecosystems.

**Forest ecosystems** - taken as dynamic complexes of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit, in which trees are a key component of the system. It characterizes the current state of forest ecosystems and it is dealing with aspects where an attempt is made to resolve in the objectives.

**Grassland ecosystems** - this chapter is concerned with dry grassland and also hydrophilic to wetland communities. It also summarizes current problems in the ecosystems, including farming, invasive alien species that threaten

ecosystems, *etc.* In the objectives, it specifies how the unfavourable state can be improved.

**Inland Water and wetland ecosystems** - the chapter describes ecosystems used as natural water resources that are vulnerable to changes in the hydrological regime and insensitive anthropogenic disturbances. It is concerned with running and stagnant (lentic) water, wetland ecosystems, their management, factors affecting their functioning and it describes steps for improving the situation.

**Mountain ecosystems** - these ecosystems are defined as important sources of water, energy and biological diversity, other sources, e.g., of mineral substances, forest and agricultural products and recreational potential; the chapter is concerned with diverse and interacting forest, water and grassland ecosystems, important local communities and inhabitants living in the mountains, the aspect of sustainable tourism, *etc.*

**Sub-national (regional) policy and land-use planning** - regional policy is concerned mainly with harmonization and balancing development in the individual regions (administrative units of the country), reducing the difference between the levels of their development and activation of the developmental potential of the regions, where land-use planning is a conceptual instrument for this process. The aspects of TSES, the European Landscape Convention and differences in economic development and the state of biodiversity are also mentioned.

**Transport** - this chapter is concerned with transport as a rapidly developing part of the economy with detrimental affects on biodiversity (extensive habitat fragmentation, natural habitat and wildlife population loss, environmental contamination and pollution). It is necessary to protect natural habitats in proposing new transport structures and to avoid large-scale habitat fragmentation and killing animals in traffic.

**Energy production** - this chapter is concerned with the aspect of energy production and the relationship between renewable and non-renewable resources. It describes in detail the subject of wind and water power plants and the use of energy from biomass. It also deals with the subject of high-voltage power lines and briefly mentions the market in electricity.

**Tourism** - can support development that stabilizes the local landscape scenery, character and functioning and is sustainable; on the other hand, it can cause spatial, qualitative and social landscape degradation or accelerate the degradation. This chapter outlines the negative impacts of tourism on nature and is concerned with sustainable tourism (*e.g.*, ecotourism).

**Climate change and biodiversity** - this chapter emphasizes the often debated relationship between climate change (change in the climatic characteristics affected by human activity; however, the consequent change also affects the natural variability of the climate) and biodiversity. The role of the National Climate Programme climatic scenarios is also mentioned

**International cooperation** - views biodiversity conservation from the standpoint of international cooperation in biodiversity conservation and management (transboundary cooperation, bilateral agreements, multilateral agreements in nature conservation, capacity building for their implementation in the CR).



## A

## STRATEGIC THEMES

I. *In-situ* Biodiversity Conservation

## I. Introduction

*In-situ* conservation is the most effective approach in biodiversity conservation. This means the ecosystem and natural habitat conservation, including maintenance and recovery of viable wildlife populations in their natural habitats and, for domesticated or cultivated species, in the environment where their typical features have been developed. Providing for tools leading to maintenance of communities and populations in the wild remains to be the best strategy for biodiversity conservation. *In-situ* conservation might not be effective where the residual population is too small to survive or the remaining individuals occur outside Protected Areas. In this case, the only conservation tool is maintenance of individuals under artificial conditions; through species survival programmes (see the *Ex-situ* Conservation chapter). *In-situ* conservation is, on the other hand, very important for the survival of wild plant and animal species that are difficult to keep in captivity. Consequently, both the *in-situ* and *ex-situ* biodiversity conservation strategies are mutually complementary.

An integral part of *in-situ* conservation has traditionally been the management of specially protected areas of national and international importance, provision for an ecological network of functional habitats, including habitat restoration and species protection in their natural habitats, of which they are an integral part. Protected areas constitute geographically delimited areas, which are designated or regulated and managed to achieve specific conservation objectives. The protective regime can include a broad range of measures, from strict conservation to sustainable use of the territory. The objective of protected areas management is to preserve a representative sample of ecosystems, species and genes of special conservation interest.

The legislative background of *in-situ* biodiversity conservation is very different in various countries. In species conservation, the European Community legislation is primarily based on international conventions and also on exact rules and regulations in biodiversity conservation. It includes the Directive 79/409/EEC on the conservation of wild birds and Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. They intend to conserve biodiversity through conservation of the most valuable natural habitats and the most endangered species of flora and fauna in the territory of the EU. The objective is implemented through the establishment of a system of protected areas of European importance called the **Natura 2000**. This includes Bird Areas (SPA) and sites of European importance (pSCI) in the Czech Republic. The Natura 2000, as the basic pillar of legally binding biodiversity conservation through territorial conservation in the EU Member States, is considered to be one of the key instruments for halting the species and habitat loss. Implementation of the Natura 2000

demonstrates considerable efforts of the individual EU Member States to provide coordinated conservation of selected species and habitats in the territory of the EU as a whole. International conventions are another important legislative instrument that the CR has pledged to implement as a Contracting Party.



## II. Current Conditions

In spite of its relatively small size, the Czech Republic is characterized by a high wild plant and animal species richness and diversity. This is a result particularly of its geographical position at the boundaries between some biogeographical regions and also of historical and cultural developments. More than 2,700 species of higher plants, 2,400 species of lower plants, 50,000 species of invertebrates and about 380 species of vertebrates have been found in the country.

In evaluating the state of nature in the CR from a pan-European point of view, it is necessary to stress two basic facts. Intensive agriculture and intensive industrial development have detrimentally affected the overall state of the environment. The impact of human activities has been reflected in the wild fauna and flora distribution and numbers and also in the overall state of habitats and ecosystems. Transitional (ecotone) areas have been disappearing from the landscape; they are important as residual habitats with high biological diversity (reed beds, hedgerows, hedges, fallow lands, flood-plain meadows, *etc.*). Recently, very intense development of linear structures and facilities leads to landscape connectivity decline and large-scale fragmentation of the wildlife species habitats. The phenomenon has a detrimental impact, not only on wild fauna and flora, but also on human beings. The landscape scenery and character have been lost at many sites and areas. In spite of the overall unsatisfactory state of natural environment, valuable parts of nature have been conserved in relatively good condition in the Czech Republic, with potential for natural processes of recovery and restoration, in contrast to most of the EU-15 Member States.

Devastation of the landscape and natural resources in the country, which was accelerated in the last few decades, has led, *inter alia*, to biological diversity loss and decline in native wildlife species numbers. According to the current Red List, approx. 34% of mammalian species, 52% of nesting bird species, 50% of reptile species, 43% of amphibian species, 43% of fish species, 60% of higher plants and 43% of moss species are currently endangered in the CR. The synergy effect of many factors raised by human activities has led to such high damage to ecosystems that some species have become extinct in the country (*e.g.*, the great bustard – *Otis tarda*).

In order to conserve biodiversity in the landscape, it is important to provide effective conservation of species of flora and fauna, including their natural habitats. Species protection is based on the Act No. 114/1992 Coll., on the Protection of Nature and the Landscape, as amended (hereinafter the Act on Protection of Nature), Decree No. 395/1992 Coll., and Act No. 100/2004 Coll., on the conditions for the import and export of wild fauna and flora. The Act on Protection of Nature defines general and special species protection, according to which flora and fauna are divided into categories according to their conservation status as critically endangered, highly endangered and endangered. A list and categories of endangerment are laid down in the Decree No. 395/1992 Coll.. Implementation of the Habitats Directive led to modification of species conservation to include the category of wildlife species of European importance. All wild bird species have a specific conservation regime as a consequence of implementation of the Birds Directive (Section 5a, Act on Protection of Nature).

Targeted management, leading to the species protection, must not emphasize only various activities and measures on individual plant and animal species, but must provide for maintenance of suitable habitats and

the whole ecosystems in which these species occur. Wildlife species management based on the best science available is a key activity in nature conservation. Through its expert institutions and technical authorities, the ME, provides research and active biodiversity conservation at the level of target wildlife populations. Subsequently, in cooperation with scientific institutions and individual specialists, taxa are studied in endangered habitats, species survival techniques of endangered or naturally rare species management are tested in their habitats, i.e. *in-situ*, and elsewhere (*ex-situ*), and the management effects on selected habitats of special importance are being monitored. For some species, a decision has been taken to actively manage their populations, which also includes restocking with individuals from other parts of their distribution ranges or artificially bred by man - the Apollo butterfly *Parnassius apollo*, Noble crayfish - *Astacus astacus*, Capercaillie - *Tetrao urogallus*. Consequently, an integral part of species protection is an analysis of available information on endangered species or habitats included in the individual databases of the ME and its institutions or of other institutions. It has been many times confirmed both in the Czech Republic as well as abroad that it is the most effective to manage whole habitats and ecosystems instead of individuals, societies or populations. The biodiversity loss cannot be fully reduced by species survival breeding or growing under laboratory conditions or in captivity without feedback to the original habitats.

In the framework of territorial protection, 4 national parks (Krkonoše/Giant Mountains NP, Šumava/Bohemian Forest NP, Podyjí/Thayatal River Basin NP, České Švýcarsko/Bohemian Switzerland NP) and 25 Protected Landscape Areas have been declared to date in the Czech Republic. National parks were established in the CR in areas with high occurrence of natural and seminatural habitats and ecosystems situated outside of areas of intensive management in the last half century. Nonetheless, these areas still faced with substantial environmental problems, threats and disturbances (see the Mountain Ecosystems chapter). All NPs are of transboundary importance and are, in fact, bilateral national parks. Protected Landscape Areas (PLA) constitute a cultural landscape that has been affected by man and managed economically for a long time, with concentrated occurrence of a valuable natural habitats and of very varied landscape types. In comparison with national parks, the objective of conservation consists not only in active management of natural habitat fragments, but primarily in the development of environmentally suitable and territorially differentiated economic use of the landscape. Of all the PLAs, one third of them have been declared as UNESCO Biosphere Reserves or as Wetlands of international importance (see the Inland water and Wetland Ecosystems chapter). Together with NPs, PLAs cover 15% of the territory of the CR. The mentioned large-size Specially Protected Areas will now include Bird Areas (a total of 38 areas have been declared by the Government), with specific conservation regimes.

In addition to the two Specially Protected Area categories, the Act on Protection of Nature also includes four categories of small-size Specially Protected Areas, which protect smaller sites or important landscape phenomena and features. Many of these sites have substantial importance for biodiversity conservation in the cultural landscape.




### III. Problem Issues

1. In spite of the considerable improvement in the quality of the environment confirmed by various indicators, which has been a consequence of huge changes in industry, energy production and agriculture since 1990, the quality of ecosystems have not been improved yet in such an extent. Consequently, some improvement in biological diversity in recent years can be found only in individual features, e.g., in the increase of numbers of some mammalian and bird species. However, no substantial improvement is apparent at the habitat and ecosystem level.

2. Various *in-situ* conservation aspects are not adequately interconnected in the legislation at other sectors level and also by related laws and legislative standards in nature conservation (e.g., gaps are apparent both in the Criminal Code in demonstrating intent and in misdemeanour proceedings).
3. In spite of the relatively large system of Specially Protected Areas, no comprehensive assessment of its representativeness and the quality of the objects of protection in relation to the habitat occurrence and number has been carried out. In addition to Specially Protected Area management, representing typical habitat and wildlife species of the particular biogeographical unit or habitat type, there are undoubtedly areas that require specific management measures to be applied to achieve the conservation objective. However, at the present time, no general system has been introduced for planning and assessing the national system of Specially Protected Areas, monitoring changes in the object of conservation, biodiversity identification and monitoring in Specially Protected Areas and proposing indicators of the effectiveness of Specially Protected Areas for achieving the conservation objectives (see the Monitoring and Indicators chapter).
4. In economically utilized areas, *i.e.* in the vast majority of protected areas in Central Europe, it is advantageous to implement ecosystem and holistic approach to the natural resource management, integrating sectoral policies and biodiversity conservation. Implementation of the ecosystem approach principles requires substantial re-evaluation and improvement of the existing instruments. The ecosystem approach is currently only theoretically recognized as a basic instrument in wildlife species and habitat management. The aspect also includes transboundary cooperation in management of protected areas.
5. Information on Specially Protected Areas is collected in the Central Nature Conservancy Register. In spite of the fact that individual surveys of protected areas are published, there is a lack of regular assessment reports, primarily because no standard criteria and indicators have been introduced for such a process incl. and their effectiveness in biodiversity conservation assessment.
6. Although conditions have been gradually improving in communication with land owners and NGOs, gaps continue to exist in including the local population in discussions on the objectives of protection of a territory and species in a given area. Difficulties are also encountered in inclusion of the private sector in biodiversity conservation. On the whole, communication and public discussion on the conditions, objectives and effectiveness of protected areas is inadequate.
7. The benefits raised and generated from Specially Protected Areas and the necessary investments for maintaining the benefits are not unambiguously defined. The benefits include both direct economic gains and also non-utilitarian and cultural values. They require differentiation between the role of the owner and of the other stakeholders, who have a justified interest in areas that are important from the standpoint of biodiversity. Simultaneously, there is no assessment of the existing or necessary capacity for effective biodiversity conservation in the Specially Protected Area system.
8. The ecosystem management and restoration in the landscape outside the Specially Protected Areas, *i.e.*, in non-reserved landscape is not considered to be a priority in the framework of sectoral policies. Biodiversity in the non-reserved landscape does not have sufficient species representation, although the numbers in some species may exhibit substantial increase. Processes in the current cultural landscape have exhibited slow positive changes in biodiversity (agriculture, forestry, water management, *etc.*). Landscape management measures and the effectiveness of ecological networks are not regularly assessed and thus, there is a lack of feedback on the effectiveness of expended investments.
9. There is insufficient utilization of the non-reserved landscape tool through spatial planning. The establishment of limits on land-use in relation to biodiversity conservation has not been sufficiently elaborated and further developed.





## IV. Objectives

1. Assess the existing Specially Protected Area system and ensure its optimization (Decision VII/28). This system has been established on the basis of various points of view and with various objectives over some decades, and thus it is necessary to assess the individual Specially Protected Areas and propose an optimal protective regime and management according to current knowledge and needs. The capacity for Specially Protected Area planning, management and administration should be increased at the national and sub-national (regional) level.
2. Through monitoring using a field network of sites identify trends in ecosystems and wildlife species at the national level (Decision VII/28). Collect expert and scientific results according to standardized criteria in reference networks in national ecosystem and wildlife species databases (database of natural forests, database of species occurrence, database of the occurrence and habitat types of lower and higher plants). Employ the information obtained in methodical instructions for Specially Protected Area management and in wildlife species and ecosystem management and publish the information regularly in reports on the state of Specially Protected Areas.
3. Continue in standardization in preparing management plans, provision for management of Specially Protected Areas and assessment of the management outcomes, applying the ecosystem approach principles in *in-situ* biodiversity conservation. Establish favourable conditions for transboundary cooperation in implementation of management plans for bilateral protected areas.
4. Technological protection (species survival implementation by breeding or cultivation under artificial conditions, see the *Ex-situ* Biodiversity Conservation chapter) should not be the main, key means in biodiversity conservation (it has a very narrow emphasis and is economically expensive). The main starting point for maintaining and increasing the number of species (species richness) consists of habitat and ecosystem management and of the establishing suitable conditions for their further existence.
5. Systematically improve communication at the national and local level, improve the involvement of non-governmental organizations and all stakeholders in the Specially Protected Area management and development and in other instruments of *in-situ* biodiversity conservation.
6. Create suitable political, institutional and socio-economic instruments, tools and ways for *in-situ* biodiversity conservation, including incentive measures in the framework of sectoral plans, strategies and policies.
7. Include *in-situ* biodiversity conservation in sectoral policies in the sense of sustainable development (The Agenda 21) in the sectors that significantly participate in the landscape management and use (MA – National Forest Programme, Ministry of Industry and Trade, MIT – State Energy Policy, *etc.*, Ministry of Transport, MT – State Policy for Development of the Transport Infrastructure, Ministry of Regional Development, MRD – territorial technical documents for strategic and sub national= regional planning) and do not limit this to the ME only.
8. Ensure economic effectiveness of investments in relation to benefits, consisting in the biodiversity conservation or restoration.
9. Provide financial support to technological interventions leading to an increase in the adaptive capabilities of ecosystems. Cooperate in developing limit levels for pollutants and other contaminants and other risk factors in relation to habitats and ecosystems. New load, burden and stress factors on the environment (global climate change, nitrogen deposition, *etc.*) require new *in-situ* adaptation measures, which must be monitored in relation to the expected results for society and the environment.

## **Related documents**

Act No. 114/92 Coll., on the Protection of Nature and the Landscape, as amended

Decree No. 395/1992 Coll., implementing certain provisions of the Nature Protection Act

Council Directive 79/409/EC - on the Conservation of the Wild Birds

Council Directive 92/43/EC - on the Conservation of Natural Habitats and of Wild Fauna and Flora

Red books and Red lists of endangered species

CBD COP Decision II/7 - Consideration of Articles 6 and 8 of the Convention

CBD COP Decision VII/28 - Protected Areas (Articles 8 (a) - (e))


UNEP/CBD/SBSTTA/9/INF/3. Report of the ad hoc technical expert group on protected areas.

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## I. Introduction

The anthropogenic transfer of taxa across the boundaries of biogeographic areas is an unavoidable phenomenon accompanying the human civilisation development. This chapter is concerned with both non- native species (exotic, intentionally and unintentionally introduced, advent species) and spontaneously spreading species that are of long-term importance in their negative impact on the environment, economy and human health. This is called an invasion and these are termed invasive species.

Species that have occupied an area over a long period of time but only recently have begun, for various reasons, to spread to other habitats, can have similar consequences. This is called expansion and these are known as expansive species.

The negative effect of invasive alien species (IAS) has increased in connection with increasing mobility, trade and tourism, accompanied by the on-going and expected globalization. However, this process is most frequently related to economic utilization of species in gardening, agriculture, fisheries, farm and hobby and pet keeping (breeding and cultivating) and forestry and can be connected with GMOs – genetically modified organisms.

A number of international multilateral agreements have been adopted in connection with the negative impacts of invasive alien species: *e.g.*, International Plant Protection Convention (Rome, 1951), the Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979) and the Convention on Biological Diversity (CBD, Rio de Janeiro, 1992). According to the CBD, the handling of these species should be subject to the principles adopted by the Sixth Conference of Parties to the CBD in 2002. According to the Decision VI/23, the most important principle for effective implementation of the Article 8 (h) of the Convention, which is concerned with this subject, is the **precautionary approach**. It follows from this that lack of scientific certainty about the environment, social and economic risks and threats that could be caused by invasive alien species should not be used as a reason for failure to adopt preventative measures against the introduction of potentially invasive alien species.

In the framework of the Bern Convention, the Pan-European Strategy on Invasive Alien Species was adopted in 2003 as an instrument to assist European countries in implementing obligations including veterinary and phytosanitary measures. On the basis of the experience raised, suitable programmes, measures and top-priority actions in eliminating these species from the environment, which they have invaded, are to be proposed, implemented and evaluated. Simultaneously, the Contracting Parties to the Bern Convention are requested to develop, adopt and implement national strategies.

The EC legislation deals with the subject in the Directive **79/409/EEC** on the conservation of wild birds and the Directive **92/43/EEC** on the conservation of natural habitats and of wild fauna and flora. According to these two Directives, the deliberate introduction into the wild of any non-indigenous species must be performed so as not to damage natural habitats or the native wild fauna and flora.

Since 1969, the programme of the SCOPE has been in operation, followed in 1982 by the Ecology of Biological Invasions Programme and, from 1997, the Global Invasive Species Programme – GISP, which is currently in the second phase. IUCN – the World Conservation Union – established the Invasive Species Specialist Group to

assess the impact of invasions on ecosystems. One of its outputs is the Global Invasive Species Database. At the present the ALARM project is being implemented within the 6th EC Framework Programme for Research and Technological Development, evaluating the negative environmental impacts of human activity; one of its themes is concerned with biological invasions.



## II. Current Conditions

### a) Current Conditions in Plant Invasions

The knowledge on non- native species of higher flora has been well elaborated as a consequence of a long tradition of research in the subject. At the present 1,378 non-native species going wild and domesticated species are present in the nature in the CR (one third of the whole Czech flora). 90 of these species have been classified as invasive alien species that frequently irreversibly damage the communities into which they penetrate<sup>1</sup>.

The most important invasive alien plant species include the giant hogweed (*Heracleum mantegazzianum*), invading the colder areas of the CR (substantial damage has been caused, e.g., in the Slavkovský les PLA), knotweed (*Reynoutria* spp., 3 species) and North American aster species (*Aster* spp.), spreading extensively especially along watercourses, and also species invading grassland and steppe habitats, such as the tree of heaven (*Ailanthus altissima*), black locust or false-acacia (*Robinia pseudoacacia*), matrimony vine (*Lycium halimifolium*) and species spreading in forests – the red oak (*Quercus rubra*), eastern white pine (*Pinus strobus*) and mahonia (*Mahonia ilex*).

Of the lower plants and fungi, extensive study has been carried out on the Australian (Cape Thread) moss *Orthodontium lineare*. This species prefers secondary spruce and pine plantations. It had been recorded for the first time in the CR in 1964 and was present at more than 300 sites in the 1990s<sup>2</sup>.

### b) Non-native Animal Species

Information on the spread of non- native animal species is only sporadic for the area of the CR and, in contrast to higher flora, a general overview is lacking. The most common reason for their introduction is commercial breeding of farm and game animals and also the irresponsible introduction of new species. Most of information on the spreading and impact of non- native species has been collected for vertebrates. These consist of approx. 13 fish, 5 bird and 12 mammalian species.

The American mink (*Mustela vison*) remains one of the most frequently mentioned mammalian species in relation to biological invasions. The North American species was kept for commercial reasons as a fur animal in many European countries and on the territory of what is now the CR. It was both introduced intentionally and also escaped from captivity unintentionally. Its current distribution prevents the recovery of the native European mink (*Mustela lutreola*) and also poses a negative predatory pressure on endangered animal species, such as the stone crayfish (*Austropotamobius torrentium*) or the dice snake (*Natrix tessellata*).

The northern raccoon (*Procyon lotor*) has become successfully acclimatized in Austria and Germany. A similar process can also be expected under the conditions in the CR. Because of the raccoon's food spectrum, it can

1 (Pyšek et al., Preslia 2002)

2 (Soldán, Zprávy Čes. Bot. Společ. 14, 1997)

be expected that this species will have a detrimental impact on the native wild animal populations and communities.

The intentional introduction of hybrids of the mallard (*Anas platyrhynchos*) and domestic forms into the nature could be a dangerous intervention. This causes permanent invasion of hybrids that is supported by humans. Although the majority of these individuals are hunted in the autumn each year, some enter into the reproduction process, breeds successfully with the native wild population and thus damage the species genome in Europe as a whole (genetic pollution).

The introduced Asian fish species stone maroko (*Pseudorasbora parva*) is a competitive species to small carp species and excludes, e.g., the sunfish (*Leucaspis delineatus*).

Of invertebrates, the greatest number of studies have been carried out on the impact of invasion by North American crayfish species: the signal crayfish (*Pacifastacus leniusculus*), which was imported from Sweden and introduced for commercial production, and the striped crayfish (*Orconectes limosus*), which probably spread spontaneously along the Elbe River from Germany. Both species have become a reservoir and vector for crayfish disease (caused by the fungus *Aphanomyces astaci*), which is decimating the native crayfish populations

Approximately in the mid-1990s, the horse-chestnut leaf miner (*Cameraria ohridella*) began to spread throughout the CR. It is a small butterfly originating in the Balkan Peninsula, Asia Minor and the Caucasus. It attacks the horse chestnut (*Aesculus hippocastaneum*) leaves which dry out after being invaded by the larvae. The chestnut is also a non-native tree species that originated from the same area as the above insect species.

### c) Activities to date to reduce the negative impacts of biological invasions

Problematic biological invasions are the basis for the activities of many research institutions; invasive alien species management is carried out both by the state administration bodies and also by NGOs in individual parts of the Czech Republic. Nonetheless, a satisfactory approach has not been found and no policy document on nature conservation and landscape management is concerned with this subject.

#### a) Legal Instruments

All the activities to date related to biological invasions have been substantially limited by the inadequate environmental protection legislation. The subject is only briefly mentioned in some pieces of legislations.

The Act No. **114/1992** Coll., on the Protection of Nature and the Landscape, as amended includes some preventative measures to avoid the spread of non-native species (i.e., dispersal and migration as well as the distribution range expanding). The Act states that intentional introduction of geographically non-native wild plant and animal species in the landscape is possible only with the permission of the Nature Conservancy authorities. This provision in the Article 5 (4) does not apply to non-native plant species if management is carried out according to the approved forest management plan or a forest management scheme adopted by the owner. Geographically non-native species of flora or fauna are defined in the Act as species that are not part of the natural communities in a particular region. Intentional spread of hybrids between various plant, animal species respectively in the landscape is possible only with a permit from the Nature Conservancy authorities, i.e., by the regional (=subnational) authorities. However, the Act does not impose any sanctions for failure to comply with its provisions.

The Article 4 (2) and Article 5 (a), (b), (c), (d) of the Act No. **449/2001** Coll., on hunting and game-keeping, prohibits the introduction of non- native species; nonetheless, this takes place in the framework of introduction of commercial game keeping. According to the current legislation, non- native species may be hunted only by a game-keeping manager and game-keeping guard and not by any holder of the hunting licence. Thus, the legislation has a very limited effect on invasive alien species control, elimination and eradication.

The Act No. **326/2004** Coll., on phytosanitary measures, as amended, also mentions invasive alien species, laying down the obligation of the phytosanitary administration to monitor, among others, the occurrence of harmful invasive alien organisms, which are defined in this regulation as harmful organisms non- native to a particular area that, following introduction, colonization and establishment, are capable of detrimentally affect the flora or environment in this area, including its biological diversity (Article 10 (1)). The paragraphs 8 to 13 also include the principles for protection against the introduction of harmful organisms during import, export and transit. The MA Decree No. **330/2004** Coll., to Act No. 326/2004 Coll., on phytosanitary measures, gives in the Annex No. 8 a list of plants intended for cultivation that are subject to subsequent phytosanitary checking following import pursuant to the Article 10 (1) of the Act.

The Act No. **99/2004** Coll., on fisheries, defines the term "non-native fish" and "non- native aquatic organism" in terms of a time period of occurrence of less than three subsequent generations in a particular fishing grounds. Thus defined taxa may be introduced only with a permit from the Nature Conservancy authority (Article 12 (6)). Act No. **289/1995** Coll., on forests, as amended, imposes the obligation on forest owners to prevent the development, spread and infestation of harmful organisms (Article 32 (1) (a) (b)). However, invasive alien plant species are not classified as harmful organisms.

#### b) Activities of state organizations and the state administration

The State Nature Conservation and Landscape Protection Programme of the CR (SNCLPP CR, 1998) does not mention invasive alien species. Objectives related to invasive alien species are included only in the State Environmental Policy of the Czech Republic 2004 - 2010 (Government Resolution No. 235/2004). This document requires a set of measures to be prepared in order to reduce the spread of invasive alien species, to reduce the introduction of geographically non-native species into nature and to prefer populations of native fish species in fish management on water courses. Surveys indicate that systematic prevention, control and eradication of invasive alien species is taking place particularly in large-size Specially Protected Areas, in the framework of the whole river basin.

#### c) Activities of non-governmental organizations

Some of the basic organizations of the Czech Union for Nature Conservation are concerned with biological invasions at the level of non-governmental organizations. Over 6.6 million CZK were invested into invasive alien species prevention, control and eradication, allocated from the Landscape Management Programme in 1997 - 2002. However, just opposite activities can also be carried out by NGOs - e.g., encouraging planting of invasive alien species (knotweed - *Reynoutria* spp.) for reclaiming and phytoenergy purposes.



### III. Problem Issues

1. The subject of invasive alien species in the CR has not been dealt with terminologically, legislatively, organizationally and financially comprehensive and complex approach.
2. There is no generally accepted method for their monitoring and total eradication.
3. There is a lack of funds for research, monitoring and/or potential interventions (Decision VII/13).
4. Criteria have not been established for assessing applications for permits from the prohibition of invasive alien introduction.
5. There is no legal punishment for negligence in invasive alien species introduction.
6. There is inadequate public awareness among the general public and target groups of the risks possessing from the introduction and spread of invasive alien species. On the basis of experience raised in other countries, it can be expected that the general public will not support the necessary measures.

In spite of the known risks, potentially invasive alien species are used especially in agricultural production, forest management and well as in garden architecture without applying the precautionary principle. From the standpoint of impact, fragmented and disturbed habitats are particularly threatened. The spread and multiplication of other species, introduced in the past, will continue even after stopping further imports, based on the time required for acclimatization of the species, which can even exceed 200 years for tree species.



### IV. Objectives

Provision for full and effective implementation of the CBD's Article 8 (h) and preparation and subsequent implementation of national binding rules in relation to invasive alien species on the basis of assessment of risks, effects and trends in non-native species that threaten ecosystems, habitats and species are of the top priority. Procedures in management and handling with these organisms should be unified.

1. A binding list of species whose introduction or spread can be considered a risk from the standpoint of potential impacts in natural ecosystems ("black list") should be published.
2. In relation to the potential for complete eradication of the individual species under the conditions of a Central European country, priority species and areas, where steps will be taken for invasive species control and eradication should be laid down.
3. Educational programs should be prepared, the general public should be informed of the risks represented by invasive alien species. Last but not least, non-governmental organizations, self-governing authorities and owners should be involved in certain projects leading to reduction of biological invasions in the country.

## **Related documents**

Act No. 114/1992 Coll., on Protection of Nature and the Landscape, as amended

Act No. 449/2001 Coll., on Hunting as amended

Act No. 99/2004 Coll., on Fish Farming

Act No. 326/2004 Coll., on the Phytosanitary Care

Act. No. 289/1995 Coll., on Forests, as amended

Decree No. 330/2004 Coll., on protection against introduction of harmful organisms through import; export of plants, plant products and other items and against their spreading at the Czech Republic territory and about the systematic Phytosanitary control

Council Directive 79/409/EC - on the Conservation of the Wild Birds

Council Directive 92/43/EC - on the Conservation of Natural Habitats and of Wild Fauna and Flora

International Treaty on Plant Genetic Resources, FAO, Rome 1991

Convention on the conservation of European wildlife and natural habitats - Bern Convention (Bern 1979)

CBD COP Decision V/8 - Alien Species that threaten ecosystems, habitats and species

CBD COP Decision VI/23 - Alien Species that threaten ecosystems, habitats and species

CBD COP Decision VII/13 - Alien Species that threaten ecosystems, habitats and species



The *ex-situ* biodiversity conservation at the genetic, species and population levels includes conservation of the components of biodiversity outside of their natural habitats. This includes primarily conservation of species in zoological and botanical gardens, arboretums, gene banks, protection of micro-organisms in collections and other facilities and institutions established for this purpose (see the Gene Banks chapter). This conservation also encompasses part of the species survival/recovery measures against the extinction of the most endangered wildlife species, which also includes, e.g., species survival programmes or recovery programmes for individual wild plant and animal species. The objective of this keeping, breeding and cultivating measures is to maintain and recover the populations *in-situ* (see the chapter on *In-situ* Conservation), in the original habitats and under suitable conditions. All these institutions should participate in conservation of biological diversity of genes, species and populations, and should mutually cooperate and raise public awareness of nature conservation and generally environment management .

### a) Zoological Gardens



#### a) I. Introduction


In accordance with the European Communities legislation, the purpose of zoological gardens is to contribute to preservation of the biological diversity of wild animals through breeding in captivity, with emphasis on the endangered species recovery, as well as public environmental education in relation to nature conservation.



#### a) II. Current Conditions


At the present, there are 16 zoological gardens in the Czech Republic, established by the municipalities, regional (=subnational) authorities or natural persons. The Union of Czech and Slovak Zoos (UCSZ), associating Czech and Slovak zoological gardens, was established in Bratislava in 1990 to coordinate activities of zoological gardens and their cooperation. The union is a member of EAZA (European Association of Zoos and Aquaria), WAZA (World Association of Zoos and Aquariums) and IUCN - The World Conservation Union). Pursuant to the Act No. 162/2003 Coll., on the conditions for the operation of zoological gardens and amending some laws (Act on Zoological Gardens), which implements the Council Directive 99/22/EC relating to the keeping of wild animals in zoos, zoological gardens are granted a licence, not only to existing but also to new applicants that fulfil the conditions. The Government Regulation No. 17/2004 Coll., on the rules for the provision of subsidies to the operators of zoological gardens, outlines the conditions for allocation of subsidies from the state budget for zoological gardens for various activities and projects. The basic conditions for the provision of subsidies include three areas:

1. Breeding of endangered species of global fauna in Czech zoological gardens.
2. Incorporation of Czech zoological gardens into nature conservation activities in the Czech Republic.
3. Cooperation of Czech zoological gardens in the framework of international programmes of endangered species breeding with important zoological gardens and institutions abroad.



### a) III. Problem Issues


1. Limitation of support for zoological gardens from the state budget through subsidies in relation to the overall volume of funds in the budget of the Ministry of the Environment approved for the given calendar year.
2. Low awareness among general and professional public of the international activities of zoological gardens (e.g., repatriation of some species into the wild).
3. Ignoring of the importance and potential of species collections in zoological gardens by expert and technical institutions.
4. Further management of dead bodies for scientific purposes. The dead bodies of endangered species individuals often irremediably end up in rendering plants.



### a) IV. Objectives

1. To increase the participation of zoological gardens in environmental communication, education and public awareness.
2. Active participation of zoological gardens in scientific and research biodiversity conservation at the genetic, species and ecosystem levels, including further use of the dead treated bodies and tissues of endangered animal species for scientific purposes, public awareness and education.

## b) Species Survival/Recovery Programmes



### b) I. Introduction

Species survival/recovery programmes for specially protected species of flora and fauna (see the Decree No. 395/1992 Coll.) are provided for by the State Nature Conservancy authorities in an attempt to establish conditions permitting management of their populations that should lead to a reduction in the degree of risk to them (the Article 52 of the Act No. 114/1992 Coll., on the Protection of Nature and the Landscape, as amended). Species survival/recovery programmes as *ex-situ* measures is an integral part of *in-situ* species protection. They need not always represent species survival/recovery cultivation or artificial breeding of individuals in captivity and their release or transfer to suitable habitats. They are mostly active measures for *in-situ* species conservation, supplemented by *ex-situ* keeping. The term species survival/recovery programme is often confused with the term "action plan" or "management programme" which, however, have no basis in the Czech Republic legislation, and activities to conserve species are also carried out for species that are not endangered in the country.

**Stations for injured and disabled animals** are rescue stations for injured or disabled specimens of wild species and their purpose is, where possible, to release the individuals back into the wild after healing. Although this does not constitute a facility for *ex-situ* animal conservation in the true sense of the word, as these are measures for specific injured and disabled specimens, these stations play an important role especially in the public awareness and education. An important part of their activities consists in awareness of and education of the general public and target groups in species protection, which is frequently improperly understood and applied by the general public (e.g., well-intentioned but, from a nature conservation viewpoint, improper care of young

animals in the summer thought to be left by their parents, actions to be taken to support hedgehog survival in the autumn, etc.).



## b) II. Current Conditions

The very first attempt at species survival/recovery breeding in the country (although this was apparently motivated by financial considerations) was the breeding of the European beaver (*Castor fiber*) in captivity and its subsequent re-introduction into natural habitats at the turn of the 18<sup>th</sup> and 19<sup>th</sup> centuries in the Schwarzenberg estates in South Bohemia. Some measures have been implemented (and are continuing) in the Czech Republic to conserve endangered species since the 1980s. These include, e.g., the re-introduction of white-tailed eagles (*Haliaeetus albicilla*) in the Třeboň Basin area, lynxes (*Lynx lynx*) in the Šumava/Bohemian Forest Mts., protection of the giant lousewort (*Pedicularis exaltata*) in the Bílé Karpaty/White Carpathians Mts., measures to protect the spring pasque flower (*Pulsatilla vernalis*) in the Třeboň area and in Krkonoše/Giant Mountains, and survival cultivation and strengthening the population of endemic Bohemian sand pinks (*Dianthus arenarius* subsp. *bohemicus*).

The actual status of a species survival/recovery programme was officially introduced in the Czech Republic in 1992 through Act No. 114/1992 Coll., on the Protection of Nature and the Landscape, as amended. Since the Act came into force, the Ministry of the Environment (ME) has so far approved 5 species survival/recovery programmes (lynx, capercaillie (*Tetrao urogallus*), river mussel (*Margaritifera margaritifera*), long-stalked pond weed (*Potamogeton praelongus*), and marsh angelica (*Angelica palustre*)).

Further species survival/recovery programmes have been prepared for at least 5 plant species and a number of animal species. Some of these projects are national-wide, while others are more regional or even local ones. Species survival/recovery programmes for the peregrine falcon (*Falco peregrinus*) and saker falcon (*Falco cherrug*) have been in operation for many years; they do not officially have the status of species survival/recovery programmes, but are coordinated by Advisory Committee appointed by the Director of the Agency for Nature Conservation and Landscape Protection of the CR (ANCLP CR).




## b) III. Problem Issues

1. There is a lack of a comprehensive concept of species survival/recovery programmes for species protection in the CR to allow establishing priorities in the subject and of rules for the preparation, approval and implementation of species survival/recovery programmes for selected species.
2. Uncoordinated and highly dispersed active measures for specially protected species by various Nature Conservancy authorities and non-governmental organizations, often not based on monitoring of the population in their natural habitats and the impact of the particular measures.
3. Inadequate financing of the species survival/recovery programmes, which must then be funded in a disorganized manner from various sources for various organizations (SEF -State Environmental Fund, Landscape Management Programmes, ME).
4. General perception of species survival/recovery programmes in a narrower sense (*sensu stricto*), as partial measures, without emphasis of the necessity and utilization of contemporary scientific knowledge, viewing of the subject in its entirety, including the necessary monitoring (see the chapter on Biodiversity Monitoring and Indicators). The public is often informed on species survival/recovery measures as good intentions alone

(including rescue transfers) on some specimens, without consideration of the consequences for the long-term population viability and of the biota at the alternative habitats.


5. Low public awareness of the existence, purposes and objectives of species survival/recovery programmes.
6. Low genetic diversity (where there is a low number of individuals for species survival/recovery breeding).



## b) IV. Objectives


1. Provide for measures against the most threatened plant and animal species extinction (e.g., species survival/recovery programmes, I endangered species action plans) (SEF).
2. Define the priorities for species survival/recovery programmes with emphasis on critically and highly endangered species (SNCLPP CR) on the basis of comprehensive binding species survival/recovery programme policy.
3. Provide for complete and long-term financing of a narrow selection of well-prepared species survival/recovery programmes for flora and fauna (including research and studies, as well as monitoring their implementation).
4. Involve non-governmental organizations in species survival/recovery programmes and informing the public of the threats and risks to species and real possibilities and ways of active individual, population and species protection.
5. Promote stations for injured and disabled animals and their use for environment communication; education and public awareness (see the chapter on Communication and Education).
6. Elimination of the problem of unification and decline in intra-specific diversity (inbreeding, inzucht).

## c) Botanical Gardens and Arboretums



### c) I. Introduction

The purpose of some botanical gardens, in addition to education on conservation of flora, enlightenment and education and recreation of visitors and also conservation of the biodiversity of wild flora, also includes active care for conservation the global flora *in-situ* gene fund. They can also contribute to the conservation of nature as their live collections and herbaria of dried plants are amongst the best sources of information on the spreading of plants and their requirements on the environment. There are about 1600 botanical gardens in the world with significant plants collections. Recently, botanical gardens have specialized on cultivation of rare and endangered species and many of them have specialized on certain types of flora. The collection of aquatic and wetland flora in Třeboň is such a specialized collection in the Czech Republic. They can contribute to effective conservation of endangered flora under natural conditions through their sale to interested persons.



### c) II Current Conditions

There are more than twenty botanical gardens in the Czech Republic, under various types of management. A Consulting Committee for Botanical Gardens, under the professional auspices of ANCLP CR, existed at ME from 1992 to 2000 for coordination of the work of botanical gardens. The existence of the consulting committee

permitted the creation of link between nature conservation and botanical gardens with their practical experience and spatial capacities in conservation of the wild flora gene fund. At the present, there is no consulting or methodical body for botanical gardens.



### c) III. Problem Issues

1. There is no central overview of the activities of individual gardens and their participation in survival/recovery programmes on a national, European and global level.
2. There is a lack of a methodical and coordination platform for botanical gardens and there is a loss of the professional potential of gardens for professional projects in *in-situ* plant conservation.



### c) IV. Objectives

1. Greater participation of botanical gardens in plant survival/recovery programmes and increasing awareness of the professional public about the focus and work of botanical gardens. Emphasis on conservation of autochthonous flora species (without consideration of attractiveness).
2. Connection of information on plants cultivated in botanical gardens with the Information System of the Convention on Biological Diversity (see the chapter on Exchange of Information).
3. Participation of botanical gardens in environmental communication, education and public awareness in connection with participation in survival/recovery programmes and active measures in species *in-situ* conservation.

## Related documents

Agenda 21 - 15.3, 15.5 g

Convention Text - Article 9 - *Ex-situ* conservation

CBD COP Decision III/1 - Annex 2, § 3 - agriculture

CBD COP Decision IV/1 D, Annex /Taxonomy/,

CBD COP Decision V/5 - § 26, Annex B, element 4, act 4.4

CBD COP Decision V/23 Annex , § 9 , act 7f

CBD COP Decision VI/9, Annex - § 14b,

CBD COP Decision V/10 - Global Strategy for Plant Conservation

CBD COP Decision V/26 A, odst.11 - Access to Genetic Resources

CBD COP Decision V/26 C, Art. 4 - *Ex-situ* collections

CBD COP Decision VI/6 Annex, Article 14 b) - The International Treaty for Plant Genetic Resources for Food and Agriculture


CBD COP Decision VI/24 D, Art. 8 - Other issues relating to access and benefit sharing

Act No 162/2003 Coll., on ZOOs as amended

Council Directive 1999/22/ES, on the Keeping of Wild animals In ZOOs

Government Regulation No. 17/2004 Coll., on Rules of providing subsidies for ZOO keepers

Klaudisová A [ed.] 2002: Guidelines survival/recovery programmes for specially endangered species of vascular plants and for animals, (only in Czech) ANCLP CR Prague: 48 pp




## I. Introduction

Genetic banks (gene banks) consist in facilities and systematic measures for conservation of the living organisms genetic diversity in the form of seeds, pollen, sperm, embryos, plant and animal tissues maintained under cryogenic conditions or in vitro cultures or (for field gene banks) in the form of living plants. In spite of the fact that the primary objective of CBD is the conservation and permanent utilization of biodiversity in the original environment - *in-situ* (Article 8 of the Convention), the use of gene banks for *ex-situ* conservation is recommended as a main supplementary activity (Article 9 of the Convention).

Organisms utilized in agriculture are one of the components of agricultural biodiversity, which includes all components of biological diversity contributing to the production of foodstuffs and other vital human needs (raw materials, pharmaceuticals, the pulling power of animals, etc.) and for maintenance of the natural environment. Genetic resources (hereinafter GR) for nutrition and agriculture including breeds, varieties, lines, races, pathogens of fauna, flora and micro-organisms utilized, cultivated and conserved by human. According to CBD, human is not included in the concept of genetic resources (Decision III/11).

On the basis of the results of the first global inventory process, the strategies prepared by FAO for plant GR are currently being reviewed. The current state of GR for farm animals requires intensification of the process of cryoconservation, accelerated obtaining of genetic material and expansion of their spectrum, both for reasons of the increased danger to populations with lower production capacity and also because of the intensive development of genomics and biotechnology.

Another of the objectives of CBD consists in facilitation of access to biological resources and provision for a fair sharing of the benefits arising out of their especially commercial utilisation (Access and Benefit Sharing - ABS). At the present, this programme is concentrated only on plant genetic resources.



## II. Current Conditions

Conversion of traditional Czech agriculture on the level of major industrial production in the 1960's to 1980's led to considerable specialisation and to limitations in the cultivation of crops and breeding of animals that were not suitable for modern production technology. The transition to market-oriented agricultural production after 1989, support for genetic improvement and the import of new varieties and breeds affected this state of affairs even more. At the present time, the number, distribution and location of breeds and varieties is affected by agricultural production economics and markets, by natural conditions and by the system of subsidies. Broader customer choice demands are increasing – requirements on diversification of agricultural and food products, specific quality and nutrition value of foodstuff (bioproducts), on production of foodstuffs for specific minorities (dietary, health, age, religious, etc.). There is also an increasing interest in the production of regional specialties (element of regional development).

The National Programme on conservation and use of plant and farm animal genetic resources and micro-organisms important for nutrition, agriculture and forest management (National Programme) has become

a fundamental mechanism in GR conservation since coming into force on September 19, 2003. The National Programme includes GR of plants, micro-organisms and farm and domesticated animals and follows on from the previous research programmes of conservation of these sources, declared in 1993 – 2003. The CR is one of the foremost countries in the world in the creation of this comprehensive system in the area of conservation of genetic resources for nutrition and agriculture.

### **The National Programme on conservation and use of plant and farm animal genetic resources and micro-organisms important for nutrition, agriculture and forest management (National Programme)**

This Programme was declared by the Ministry of Agriculture with validity from September 19, 2003 for a period of five years and is related to the on-going separate National Programmes for the conservation and utilization of plants, farm animals and agriculturally important micro-organisms and is subdivided into the following subprograms:

- 1) The National Programme on Conservation and Utilization of Plant Genetic Resources and Agricultural Biodiversity (National Plant Programme)
- 2) The National Programme on Conservation of Genetic Resources of Economically Important Micro-organisms and Tiny Organisms (National Micro-organism Programme)
- 3) The National Programme on the Conservation and Utilization of Farm Animal Genetic resources (National Animal Programme)

It is based on Act No. 148/2003 Coll. and Act No.154/2000 Coll. and on the implementing decrees to these Acts, and also on international documents that CR has incorporated into its legislation (Convention on Biological Diversity) or where the CR implements their principles (International Treaty on Plant Genetic Resources, FAO 1999). It delimits the rights and obligations of the state and other entities in relation to conservation and utilization of national GR of crops, micro-organisms and animals important for nutrition and agriculture.

Broader participation of the CR in international cooperation (e.g. in comparing micro-organisms, participation in technological teams focused on animals cloning) provides opportunities for discovering new strains that could have quite unique characteristic. Such micro-organisms strains could not only be important for the world scientific fund, but could also have commercial use.

The State Nature Conservation and Landscape Protection Programme of the Czech Republic (SPCNL CR, 1998) and the State Environmental Policy of the Czech Republic (SEP, 2004) do not mention the subject of conservation of genetic resources for nutrition and agriculture. This subject is discussed only in strategic and programme documents of MA, which are understandably concerned only with GR in agriculture.

#### **a) Farm Animals Genetic Resources (FAnGR)**

Protected FAnGR include breeds of cattle, sheep and goats, horses, pigs, poultry, rabbits, nutria, freshwater fish and bees, that originated or are long-term adapted in the territory of the Czech Republic. Breeding *in-situ* is the fundamental way of conservation of these species, permitting continuous and consistent development. In addition, the gene banks at the Research Institute of Animal Production (RIAP) in Uhřetíněves, Prague and the Research Institute of Fish and Hydrobiology in Vodňany maintain FAnGR *ex-situ*, in the form of cryoconserved reproduction material (insemination doses, embryos, stem cells, tissues). These are intended both for the regeneration of the particular GR if required and for purpose of science and research. RIAP provides for the coordination of the conservation programme and for the administration of the FAnGR data banks.



## b) Plant Genetic Resources (PGR)

Genetic resources of agricultural crops are mainly conserved in *ex-situ* form in national gene banks and research centres. GR of primitive forms and wild related species are also partly conserved in gene banks and partly through regular *in-situ* monitoring.

Seed samples of all generatively propagated agricultural crops are centrally stored in the gene bank in the Research Institute of Crop Production (RICP) in Prague - Ruzyně, genetic resources of vegetatively propagated species are conserved as field collections (field gene banks) or as *in vitro* cultures (potatoes) or in cryoconservation bank. The collected genetic resources in the CR contain almost 50 000 items and a decision will be made on inclusion of a further 6.5 thousand samples from collection expeditions in working collectives by the directors of the relevant crop collections. RICP provides coordination for the programme of conservation of PGR and also operates the National Genetic Resource Information System (EVIGEZ). Its passport part is available at <http://genbank.vurv.cz/genetic/resources>. The EVIGEZ system consists in relational database, which connects the passport information with the descriptive data and with records kept by the gene bank deposit (see the chapter on Exchange of Information). It also has the task of collecting important GR for nutrition and agriculture in the framework of collection expeditions.

Forest tree species genetic resources constitute of sets of reproduction material of all species of trees, stored in *in-situ* form - genetic bases, tree stands recognized for harvesting seeds and select trees, or in *ex-situ* form - reproductive (seed) stands, seedlings, maternal trees, clone archives and collections of reproductive material (banks of forest seeds and banks/archives of forest tree species explants). The Forestry and Game Management Research Institute in Prague - Zbraslav keeps the central records of recognized sources of reproductive material of forest tree species.

## c) Genetic Resources of Economically Significant Microorganisms and Tiny Animals (GRM)

These resources include independent collections of pathogenic and industrially useable micro-organisms and minor flora and fauna of economic importance (pests on agricultural crops and pests in food storages).

Pathogenic viruses, fungi, bacteria and minor fauna are located in the individual collections at RICP. Pathogenic viruses of potatoes, fruit trees, decorative plants, zoo-pathogenic micro-organisms, pure dairy cultures of Lactoflora, brewery yeasts, industrially useful micro-organisms and other phytopathogenic micro-organisms (fungi, cyanophytes and algae) are kept at external workplaces. There are thousands of items in these collections, which are registered in the Database of the National Micro-organism Programme and are available at the web site [http://www.vurv.cz/collections/collection\\_cz.htm](http://www.vurv.cz/collections/collection_cz.htm). RICP in Prague - Ruzyně is responsible for coordination of the conservation programme of GRM.

## d) Other Genetic Resources

Genetic resources of wild fauna, flora and micro-organisms, which are not used in agriculture, food industry or other industry, are not systematically monitored and collected, although they are used in the framework of research.

The nature of their (usually temporary) collection for these purposes corresponds to the principle of a gene bank, but the basic features of systematic and permanent collections are lacking. Because of the absence of any conception and programme in this area, no funds are set aside for keeping inventories, evaluation or


maintenance of these collections. The gene bank at RIPC in Prague - Ruzyně and the gene bank in Olomouc keep some wild plant species. Other species are kept through ex situ cultures, amongst other things, in botanical gardens, research institutes and universities (Botanical Institute AS CR, the Silva Tarrouca Research Institute for Landscape and Ornamental Gardening, the Forage Plant Research Institute in Troubsko, the Biology Faculty of the University of South Bohemia, insect gene bank of the Entomological Institute of the Academy of Sciences, etc.).

At the present time, a study is being prepared for evaluation of the possibility of systematic research on the wild flora genetic base and genetic resources collection of using current capacities or with the possibility of creation of central or regional gene banks.



### III. Problem Issues

1. The non-uniform and uncoordinated system of the national databases limits access to information. CHM is not yet fully functional, so uncoordinated or duplicity activities cannot be excluded.
2. Programmes for conservation of GR require a more open conception, permitting operative classification of new genetic resources and reduced support for those that are no longer endangered.
3. Economic use of a limited spectrum of species to a greater extent sometimes leads to reduction in diversity down to the genetic level (unification - e.g. cultural species of grasses, etc.). There is a risk of extinction of locally specific populations of wild flora and some wild fauna through genetic erosion. Simultaneously, research on and collection of genetic material for wild flora and fauna is currently in its infancy. No inventories have been prepared and databases are nonexistent for genetic resources that are not used for agricultural or industrial purposes.
4. Conservation of GR for nutrition and agriculture through the current form of *in-situ* support does not guarantee a permanent solution to the problem. Original breeds and varieties with low competitiveness continue to be replaced or crossed with "global" breeds and varieties improved for intensive production. The number of breeders and growers of original breeds and varieties is constantly decreasing as farmers grow older and life styles change.
5. The legislative basis - incomplete international framework (work on preparation of an international treaty on FAnGR is not expected to begin before 2007). This leads to a lack of national legislation (a weak consideration is being given to a law on GR of farm animals, the Act No. 154/2000 Coll., on Livestock Breeding and Improvement, requires amendment).
6. Difficulties persist in relation to ownership of GR arising out from controversies between the private holders of genetic resources and the responsibility of the state for their maintenance.
7. The system of financial support for conservation programmes on the year-to-year basis is unworkable. Financing cannot be interrupted without the risk of irremediable damage; provision for long-term certainty of the required volume of funds is a necessary condition for the effectiveness of these programmes; interruption of financing frequently de facto means the loss of the sum of all the expenditures to date.
8. The potential for the use of biotechnology for renewal and extension of genetic diversity is currently limited, especially for animal GR (genetic engineering, transgenesis, cloning), and this is true globally. There are currently limited conditions for creating such capacities in the CR.



## IV. Objectives

Provision for an effective and permanent system of *ex-situ* conservation, including the necessary documentation and characterization of GRA, integration of these activities into national plans for development of rural areas and agriculture and cooperation at a global level in this respect. Make background for future activity.

Membership in some collections of the European Culture Collection Organization (ECCO) and in the World Federation for Culture Collection (WFCC) imposes the obligation in the CR to provide reciprocal information on GR of micro-organisms, its catalogues and, on request, also for conserved strains of micro-organisms. The same obligations can be expected following signature of similar agreements on FAnGR. The EVIGEZ flora information system is part of the global information network on plant genetic resources.

In order to provide for these and future related activities, it is necessary in the framework of gene banks and MA to concentrate on existing problems and provide for their solution, to prepare a general framework to support their work and to enable their functional incorporation into the general context of the Strategy. **This will lead to implementing objectives, in an order according to their urgency:**

1. Stop the trend in the current decrease in the diversity of plants, animals and micro-organisms used in agriculture and the food industry and a transition to a gradual increase through the creation of and support for suitable production systems and inclusion of the principles of conservation management in improvement programs.
2. Provide for GR cryoconservation in the national gene banks (in accordance with Decision V/26, which requires the creation of capacities for the maintenance and use of ex situ collections) and create expert and information systems for planned conservation management and reconstruction genetics, in accordance with the requirements of Decision III/11.
3. Prepare a legislative framework and ensure its regular supplementing by legal regulations compatible with internationally accepted obligations (International agreements on plant genetic resources for nutrition and agriculture - Decision VII/3, a legislative basis for permanent financial provision for the operation and maintenance of genetic collections – Decision V/26 and others expected in the future).
4. Create conditions for constant development of all GR (including those that are not used for agricultural and industrial purposes), including access to them and fair and equitable sharing of the benefits arising out from their use.
5. Increase the level of communication and cooperation with users (stakeholders) to ensure factual implementation of strategic targets.

## Related documents

Act. No. 154/2000 Coll., MA Decree No.471/2000 Coll., on breeding farm animals, in line with the International initiative for the conservation and sustainable use of pollinators (COP V/5). Bees are therefore part of this law

Act No. 148/2003 Coll., on Genetic Resources of Plants and Microorganisms + MA Decree No. 458/2003 Coll.

Act No 289/1995 Col., on Forests

MA Decree No. 82/1996 Coll., on Genetic Classification, forest renewal, afforestation, an on record keeping of seeds and planting seedlings of forest wood species

Act No. 246/1992 Col., on the Protection of Animals Against Cruelty, as amended

Act No. 244/2000 Coll., on Ecological Farming, as amended

Act No. 166/1999 Coll., the Veterinary Act, as amended

CBD COP Decision III/11 - Conservation and sustainable use of agricultural biological diversity

CBD COP Decision IV/6 - Agricultural biological diversity

CBD COP Decision V/5 - Agricultural biological diversity: Review of phase I of the programme of work and adoption of a multi-year programme

CBD COP Decision V/10 - Global strategy for Plant conservation

CBD COP Decision V/26 - Access to genetic resources

CBD COP Decision VI/6 - The International treaty on Plant Genetic Resources for Food and Agriculture

CBD COP Decision VI/9 - Global strategy for Plant conservation

CBD COP Decision VI/24 - Access to genetic resources as related do genetic resources

PGR: Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture, 2002 (GPA)

International Plant Protection Convention (FAO IPPC, novela 1997) - viz invazivní druhy

International Treaty on Plant Genetic Resources (FAO Conference Resolution 3/2001)

The Report of the International Technical Conference ITCPGR/96/REP;

(Global Plan of Action - Leipzig Declaration, as adopted by the Conference)

SoW - State of the World's Plant Genetic Resources, FAO 1996

FAnGR: Global Strategy for the Management of Farm Animal Genetic Resources (FAO, 1998),

State of the World's Farm Animal Genetic Resources, 2004 (Documents of the Eight Regular Session of the CGRFA at <http://www.fao.org/ag/cgrfa/Docs.htm>)



## I. Introduction

**Sustainable use** means the use of the biodiversity components in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations. From the standpoint of sustainable use, the following components of biodiversity can be distinguished: (1) genetic material, (2) populations, (3) species, (4) functional (ecological) groups, e.g., guilds such as pollinators, and communities (in a narrower sense – synusia and in a broader sense – biocenoses) and (5) ecosystems and habitats. The long-term decline of components of biodiversity refers to a time period linked to the life history of the component of biodiversity concerned. It is crucial that the biodiversity in ecosystems is maintained to ensure that those ecosystems are capable to sustain the ecosystem goods<sup>3</sup>, on which both biodiversity and people depend.

As ecosystems and ecological processes within species variability and genetic variation change variably over time whether or not they are used by human beings, this fact should be taken into consideration in biological diversity management so that it is possible to come accommodate the changes and also stochastic events that may influence the sustainability of a use. Simultaneously, it is apparent that sustainable use of specific components of biological diversity is hard to imagine without *adaptive management*, i.e. extremely flexible management. Thus, the sustainable use of biological diversity is an integral part of the *sustainable development* concept.

The sustainable use of the various components of biodiversity has become one of the three main objectives of the Convention on Biological Diversity (CBD). Practical principles and more detailed guidelines for sustainable use of the components of biodiversity were proposed in 2001 – 2003 in the framework of CBD (see the Addis Ababa Principles). These principles will also be applied in implementation of other international multilateral agreements, particularly in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The necessity for wise management of certain wild plant and animal species also follows for the EU Member States from the Directive 92/43/EC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive, Annex V). The obligation of the contracting parties to sustainable use the populations of some subspecies and species of wild flora and fauna is also included into other international agreements (Convention on the Conservation of European Wildlife and Natural Habitats - the Bern Convention, the African Eurasian Migratory Waterbird Agreement - AEW A ).



## II. Current Conditions

The prepared amendment to the State Nature Conservation and Landscape Protection Programme of the CR promotes the idea of sustainable development and declares the idea contrary to the “strict protection” concept in nature resources management. The above mentioned policy document gives greater attention to sustainable use of the components of biodiversity in evaluation of approaches, instruments and tools in nature and landscape management. The Sustainable Development Strategy of the CR was approved by the Government of the Czech

<sup>3</sup> *Ecosystem goods* are products provided by ecosystems and used by humans, such as wood, food or medicinal substances. *Ecosystem services* are processes and conditions of natural ecosystems that support human activities and maintain existence of mankind on the Earth (photosynthesis, maintenance of atmospheric element composition, soil-formation processes, etc.)

Republic on December 8, 2004 (Resolution No. 1242/04). Its general objective is to provide for the highest quality of life for the citizens and simultaneously to establish favourable conditions for the quality of life of future generations. Sustainable use of biological resources has become part of some of the policy materials of Ministry of Agriculture of the Czech Republic.

Sustainable forest management has had a long tradition in the CR. It utilizes forest ecosystems in a wise, environmentally sound way. Approaches for sustainable use of some aquatic ecosystems, especially fishponds, have been prepared and tested on case studies. Within the GEF project *Biodiversity*, a methodology for sustainable use of biological and, in general, natural resources in the three UNESCO Biosphere Reserves (Pálava, Šumava/Bohemian Forest a Krkonoše/Giant Mts.) has been elaborated.



### III. Problem Issues

1. While a number of various procedures are now available for biological diversity conservation, either at the site of its occurrence (*in-situ*) or elsewhere (*ex-situ*), a somewhat different situation arises in relation to the sustainable use of its components. In spite of considerable developments in ecology, conservation biology and other related disciplines, knowledge is frequently lacking for the most objective identification of the optimal and simultaneously sustainable conditions for a specific population. It is undoubtedly a disadvantage that information on sustainable harvest in the long term is mostly obtained after problems arise through excessive, unsustainable use.
2. It has been found that the relevant research, monitoring and determination of subsequent limits for use should be carried out by expert and technical institutions concerned with conservation of this resource. However, this does not exclude the first two activities being carried out in cooperation with the user of such a resource.
3. Consequently, in the future, conservation research should devote increased attention to practical methods of how to quantify biological diversity and recognize its decline in time.



### IV. Objectives

1. Include sustainable use of the components of biological diversity and unify understanding of this concept in the policy materials of the other sectors, related to various degrees to conservation and management of biological diversity and sustainable use of its components. For this purpose, apply the practical principles and detailed guidelines for sustainable use of the components of biodiversity (Addis Ababa Principles).
2. Apply the practical principles and detailed guidelines for sustainable use of the components of biological diversity in case studies on sustainable use of selected populations of wild flora and fauna, breeds of farm and domestic animals and varieties and cultivars of cultural crops. Apply the experience obtained in broader practice.
3. Define and implement the indicators of biological diversity in measuring progress achieved in reducing the rate of the biodiversity loss.

### Related documents


Secretariat of the Convention on Biological Diversity (2003): Handbook of the Convention on Biological Diversity, 2nd ed. (Updated to include the outcome of the sixth meeting of the Conference of Parties). Secretariat of the Convention on Biological Diversity Montreal, 937 pp.

UNEP (2003): Sustainable use: Development of practical principles, operational guidance and associated instruments. UNEP/CBD/SBSTTA/9/9. Secretariat of the Convention on Biological Diversity Montreal, 18 pp.

CBD COP Decision V/24 - Sustainable use and cross-cutting issue

CBD COP Decision VI/13 - Sustainable use

CBD COP Decision VII/12 - Sustainable use (Article 10)



## I. Introduction

Access to genetic resources and fair and equitable sharing of the benefits arising out of their utilisation (Access and Benefit Sharing - ABS), including appropriate transfer and exchange of the relevant technologies<sup>4</sup>, taking into account all the rights over these resources and to technologies, remains one of the three main objectives of the Convention on Biological Diversity (CBD). The Convention recognizes the sovereign right of the contracting parties to establish a legislative regime for management of genetic resources. Simultaneously, the states that have assumed the obligations of CBD should attempt to create such conditions that facilitate access to genetic resources and for their use by other contracting parties in an environmentally sound way. Access to genetic resources in the framework of CBD is based on the conditions mutually agreed by the Contracting Party that provides the genetic resource and the Contracting Party that accepts them. It is important that each Contracting Party must agree in advance to access to its genetic resources, unless it decides otherwise (Article 15 of the Convention).

The Access and Transfer of Technology is another cross-cutting activity of the CBD which is related to the topic of access and benefit sharing (Article 16 of the Convention). The Contracting Parties of CBD undertake to provide and /or facilitate access for and transfer to other Contracting Parties of technologies that are relevant to the conservation and sustainable use of biological diversity or make use of genetic resources and do not cause significant damage. Access to and transfer of technology to developing countries shall be provided under fair and most favourable terms. In the past these countries were and remain the greatest donors of a substantial part of genetic resources that are used primarily in the developed countries.

The Bonn Guidelines, prepared by the ABS working group at the first meeting of the Ad Hoc Open-ended Working Group on Access and Benefit-Sharing, were adopted at the sixth meeting of the Conference of Parties to CBD (Hague, April 2002). The COP Decision recommends that the Contracting Parties use them when developing and drafting their own legislative, administrative or policy measures on access and benefit sharing. Unlike to the Cartagena Protocol on Biosafety, which is binding for its Contracting Parties, the Bonn Guidelines are implemented on a voluntarily basis.

The Open-ended Inter-Sessional Meeting on the Multi-Year Programme of Work of the Conference of the Parties up to 2010 (Montreal, March 2003) discussed ABS again and invited the Ad Hoc Open-ended Working Group on Access and Benefit-Sharing and Contracting Parties to consider the process, nature, scope, elements and modalities of an international regime on ABS. The implementation plan of the World Summit on Sustainable Development (Johannesburg, August/September 2002) also supported this concept and requested the UN Member States to begin the discussion about ABS regime.

The Second meeting of the Ad Hoc Open-ended Working Group on Access and Benefit-Sharing discussed the format of such a regime (Montreal, December 2003). The seventh meeting of the Conference of the Parties to the CBD (Kuala Lumpur, February 2004) requested the Ad Hoc Open-ended Working Group on Access and Benefit-

<sup>4</sup> *Technology* means, in this relation, not only the actual tangible technology (*hardware*), such as the various apparatus or computer networks, but also diverse methods, skills and procedures (*software*), e.g., patents, methodologies for evaluation of the degree of endangerment of taxa or ecological (functional) groups, Geographical Information Systems (GIS), procedures of modern biosystematics or genetic analysis, or the manners of management of protected species, habitats and areas. From the viewpoint of access to genetic resources and fair sharing of benefits following from their use, it is important that technology also includes biotechnology.



Sharing to elaborate and negotiate the nature, scope and elements of an international regime. An agreement was reached that these should also include traditional knowledge of the utilisation of biological diversity.

Similar to the Cartagena Protocol, there is still considerable space for agreeing on a similar mechanism so that it is difficult to assess its final form. The European Communities (EC) attribute considerable importance to ABS and, together with the group of African countries, are among the CBD Contracting Parties that will play a key role in agreeing on a specific mechanism for ABS.

The International Treaty on Plant Genetic Resources for Food and Agriculture, one of the instruments of international law, adopted at the conference of contracting parties of FAO in November 2001, is very important in this sense. The CR became a contracting party in March 2004.



## II. Current Conditions


In January 2004, the new *The National Programme on conservation and use of plant and farm animal genetic resources and micro-organisms important for nutrition, agriculture and forest management (National Programme)* came into force. This programme was approved by the Government of the CR and follows on from the previous independent national programmes for the individual types of genetic resources. The programme also encompasses provision for services to the users of genetic resources in the CR and abroad through provision of samples of available genetic resources and the relevant information under the conditions laid down by the valid international multilateral agreements and the legislation of the CR. However, it does not apply to wild flora and fauna that could be, e.g., of commercial importance for the pharmaceutical or cosmetic industry (see the Gene Banks chapter).

The aspect of fair and equitable sharing of benefits arising out of the utilisation of genetic resources, including biotechnical procedures, is not dealt in any ministerial or governmental document. It should be contained in the prepared "Material Transfer Agreement", dealing with the contract relations between the owner and the recipient of plant genetic resources.



## III. Problem Issues

1. Most of the genetic resources used for commercial purposes are derived from developing and post-communist countries, but the benefits arising out of their use flow into the developed countries.
2. In contrast to concepts from the beginning of the 1990's, when the CBD was concluded in the framework of UN, it is now apparent that CBD cannot apply to genetic resources obtained by the Contracting Parties before the Convention came into force. Especially the megadiverse countries (the Cancun group) pointed out that industry, based on biopiracy, creates a substantial part of the gross domestic product in some of the Contracting Parties and also in countries that have not yet ratified CBD (e.g. USA). Therefore the prepared ABS regime will have to constitute a compromise between the attempt to prevent biopiracy and to simultaneously respect the sovereignty of the individual contracting parties.



## IV. Objectives

1. To provide for the organizational, financial, working and other necessary capacities for implementing the Bonn Guidelines on Access to Genetic Resources and Benefit Sharing.
2. Apply the Bonn Guidelines in implementation of the *National Programme on conservation and use of plant and farm animal genetic resources and micro-organisms important for nutrition, agriculture and forest management (National Programme)*. Assess this application and provide the obtained results to the CBD Secretariat and to other CBD contracting parties.
3. Prepare search of the Czech and the EC legislation, concerning the specific aspects of ABS (survey of the CR legislation related to access to genetic resources and sharing of benefits arising out of their utilisation, including modern biotechnical procedures, aspects of intellectual property rights and patents; search into the law and conceptual documents of the EC and the EU member states concerned with this subject). Gained outcomes should be used for implementation of the Bonn Guidelines.

### Related documents

KATE K. ten, LAIRD S.A. (1999): The Commercial use of biodiversity - Access to genetic resources and benefit-sharing. Earthscan Publ. London, 398 pp.

Secretariat of CBD (2003): Handbook of the Convention on Biological Diversity, 2nd ed. (Updated to include the outcome of the sixth meeting of the Conference of Parties). Secretariat of the Convention on Biological Diversity Montreal, 937 pp.

UNEP (2004): Access and benefit sharing as related to genetic resources (Article 15). UNEP/CBD/COP/7/L28.

Secretariat of the Convention on Biological Diversity Montreal, 18 pp.

CBD COP Decision II/11 - Access to genetic resources

CBD COP Decision III/15 - Access to genetic resources

CBD COP Decision IV/8 - Access to genetic resources

CBD COP Decision V/26 - Access to genetic resources

CBD COP Decision VI/24 - Access and benefit sharing as related to genetic resources

CBD COP Decision VII/19 - Access and benefit sharing as related to genetic resources

## VII. Ecosystem Approach as the Key Principle in Management of Ecosystems

### I. Introduction

*In-situ* biodiversity management was significantly changed over the last 20 years. Although the conservation of targeted species and subspecies of wild fauna and flora is one of the traditional activities of state and voluntary nature conservation, it has been found that the most effective and usually the cheapest way of in situ biodiversity management remains the conservation of specific habitats and ecosystems management.

The *ecosystem approach* is a strategy for integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. It is based on the application of appropriate scientific methodologies focused on level of biological systems that encompass the essential structure, processes, functions and interactions among organisms and their environment. The ecosystem approach recognizes that humans, with their cultural diversity, are an integral part of many ecosystems.


The ecosystem approach does not *a priori* exclude other management and conservation approaches, such as UNESCO biosphere reservations, protected areas or single-species conservation programmes for wild flora and fauna and micro-organisms, as well as other approaches carried out under existing national policy and legislative frameworks. It rather should include the above mentioned approaches and other methodologies so as to cope with the complexity of biodiversity management and sustainable use of its components. Therefore there is no single way to implement the ecosystem approach.

At the present, the ecosystem approach is taken as a principle of a number of multilateral international agreements (Convention for the Protection of the Marine Environment of the North-East Atlantic, the Kyoto Protocol to the UN Framework Convention on Climate Change) and of international intergovernmental organizations (e.g. FAO). It has also become a part of the legislation in some countries, such as Canada. The greatest progress has been made by state institutions and the nongovernmental sector in applying the ecosystem approach in USA, where this has become the starting point for the ecosystem management, which has constituted a conceptual framework for the work of all federal institutions, focused on the environmental management, since the middle of the 1990's.

Although the ecosystem approach is considered to be one of the basic principles of CBD, it is not included in the Convention text. Nonetheless, the "Malawi Principles" (Decision VII/11) and the guidelines for their application were reviewed in this sense. It was done on the basis of case studies and experience gained to date, along with completed search of the degree to which the ecosystem approach is incorporated into CBD's thematic programmes and cross-cutting activities.


### II. Current Conditions

The principles of the ecosystem approach as formulated according to the CBD "Malawi Principles" have not been tested on any specific programme or project in the CR.



### III. Problem Issues

1. Even in the framework of implementation of CBD, the conception of an ecosystem approach is a relatively new approach: it was submitted to the CBD Parties in comprehensive form only at the fifth meeting of the Conference of Parties (Nairobi, May 2000). In the CR at the present time, there is a lack of consciousness of this approach amongst both the professional and the lay public.
2. The ecosystem approach is concerned with ecosystems characterized by substantial complexity and dynamics and must therefore be based on the fact that our knowledge of its functioning remains incomplete and that “*adaptive management*” is thus required. The current management of ecosystems must be adapted to this approach and the effectiveness of implemented measures must be evaluated in time. Ecosystem processes are frequently nonlinear and their outputs can appear only after a certain period of time. Consequently, it is necessary to take certain measures even when some relationships between causes and effects have not been completely clarified from a scientific point of view (the *precautionary approach*). Consequently, long-term support should be provided in the CR for research on the functioning of the main types of ecosystems and verification of the CBD “Malawi Principles” in concrete situations.
3. Experience has confirmed that implementation of all 12 “Malawi Principles” in an ecosystem approach is not realistic under specific conditions: consequently, they should not be implemented as an integral set but rather individually or some of them simultaneously.



### IV. Objectives

1. Application of the principles of an ecosystem approach in case studies in the basic types of ecosystems in the CR (forest, agricultural, water, etc.). Devotion of special attention to integrated river basin management (river basin plans in the sense of Decree No. 140/2003 Coll., on planning in the area of waters). In this, employ suitable proposed indicators of conditions, changes and trends in biodiversity in management CR. Employ the experience gained in a broader context in practical conservation and management of biodiversity and in sustainable use of its components.
2. Include the ecosystem approach, as defined and understood by CBD, in the conceptual materials of ME, MA and other sectors, including the Czech Republic Strategy for Sustainable Development, related to varying degrees to conservation and management of biological diversity and sustainable use of its components.
3. Employ adaptive management to a greater degree in management of the natural and landscape heritage of the CR.

#### Related documents

Secretariat of the CBD (2003): Handbook of the Convention on Biological Diversity, 2nd ed. (Updated to include the outcome of the sixth meeting of the Conference of Parties)


UNEP (2003): Ecosystem approach: Further elaboration, guidelines for implementation and relationship with sustainable forest management. UNEP/CBD/SBSTTA/9/8. Secretariat of the Convention on Biological Diversity Montreal, 27 pp.

MA Decree No. 140/2003 Coll., on the planning in the area of water

CBD COP Decision V/6 - Ecosystem approach

CBD COP Decision VI/12 - Ecosystem approach


CBD COP Decision VII/11 - Ecosystem approach



## I. Introduction

The ever-more intense activity of people and their high requirements on the multi-functional nature of the landscape, related to settlements, recreation, transport, and industrial and agricultural production and the technical infrastructure lead to socio-economic processes that have permanent consequences for the landscape. A large number of highly anthropogenically altered small, insular and scattered areas to large territories are created (corresponding to a very varied range of types, e.g. landfills, mine tips and other deposited material, old quarries, polluted water courses without accompanying vegetation, fallow lands, military domains, and abandoned settlements, especially in the border areas). Reclaiming of these very diverse areas is then very expensive and is frequently carried out unprofessionally and insensitively, in an attempt to ensure the fastest possible economic utilization and returns on the invested funds. The unnatural ecosystems created are usually unstable and require additional expensive management for further maintenance.

The ecosystem approach of monitoring of spontaneous processes in unreclaimed areas in the framework of the restoration ecology methods provides an alternative to large-area mechanical reclaiming/restoration. On the basis of studies of succession processes, there will be a greater probability of successful nature *restoration*, i.e. return of the set of flora and fauna that were the natural inhabitants prior to the beginning of the action of the detrimental factors in the particular territory. In case of fundamental, sometimes irreversible changes in abiotic conditions at a particular location, rehabilitation can even be considered successful when it entails the return of at least part of the original set of flora and fauna. The least suitable method of reclaiming (*replacement; return of the plant cover*), however, ignores the original character of the habitat and introduces a set of any kind of flora and fauna that is capable to settle in the given area at the given time, frequently without regard to the ecology principles.



## II. Current Conditions

The specific subject of unreclaimed areas in the Czech Republic has no comprehensive conception at the present, there is so far no strict and bindingly defined relevant uniform legal regulation, a methodology for carrying out reclaiming at individual types of localities (e.g. “brown fields”, old mine works, etc.) has not even been developed.

The Mining Act No. 44/1988 Coll., deals with this subject, but there is no further implementing regulation that would determine which methodology should be used. The Act No. 114/92 Coll., on Protection of the Nature and the Landscape, as amended, that prohibits the intentional spreading of invasive alien species should be followed in this case. Act No. 334/1992 Coll., on Protection of the Agricultural Land Resources, as amended, defines that it is necessary to carry out reclaiming of affected areas according to approved plans, so that they are suitable for fulfilling further functions in the landscape. The State Environmental Policy of the Czech Republic mentions the aspect of utilization of the landscape, or restoration of the function of the disturbed landscape, consisting in elimination of environmental burdens and reduction of the extent of disturbance of the landscape by minerals mining. Although newly created areas of this character are subject to at least some legal measures for decontamination or restoration the present-day landscape consists of a mosaic of these newly created areas

and residues from the past, where ownership relations and the consequent legal responsibility for the current condition and subsequent developments in the future have not been fully clarified.

There is not even a uniform conception on how to deal with unreclaimed areas in a European context. However, it can be stated with only slight exaggeration that, in the area of trends in scientifically based environmental utilisation of unreclaimed areas, the Czech Republic is, in a sense, in the forefront, at least in Central Europe, which can be documented at random, by the organization of the revolutionary and internationally recognized seminars "Restoration of Brown Coal Mining Areas", active participation in the "BioHab, a Framework for Coordination of Biodiversity and Habitats" programme, supported by the EU, participation in the Pan-European programme of monitoring burdening of the landscape by heavy metals or the creation of specific publications with complex summaries of the subject of natural succession in unreclaimed areas.

Over a large part of the territory, the ecological functions of the landscape have been damaged for prolonged periods of time by extensive mining of mineral materials, especially brown coal (mining tips in the North-Bohemian coal-mining area), stone (especially the České středohoří PLA), high-quality limestone (Český kras PLA) and also sand and gravel (e.g. Třeboňsko PLA, Litovelské Pomoraví PLA, and in the area around the Elbe River).



### III. Problem Issues

1. Disturbance of the overall appearance of the landscape (including devaluation of aesthetic values) by scattering of small unreclaimed areas to the creation of extensive territories or affecting of the appearance of entire regions.
2. Extensive disturbance of the landscape is constantly increasing in connection with the increased activity of human beings in the landscape.
3. The inadequate ability to predict further developments at a particular location in relation to the lack of scientific knowledge of spontaneous succession processes at these newly forming habitats in the landscape.
4. The risk connected with secondary phenomena, which can play a decisive role in succession processes and also affect the broader surroundings of the actual unreclaimed areas (extraction and distribution of toxic substances into the substrate, contamination of ground waters, etc.).
5. Endangering of the surrounding environment by the unintentional introduction of invasive alien taxa of flora and fauna, which can suppress or even completely replace the original taxa in a broader area (unreclaimed areas may act as an open gate to the entire ecosystem).
6. There is so far inadequate legislation.
7. There are inadequate and only scattered attempts at biological evaluation and an ecosystem approach in dealing with the subject of unreclaimed areas.



### IV. Objectives


Using suitable scientific methodology respecting a holistic, integrated approach for the biodiversity of ecosystems, certain model principles can be derived; these will be used primarily in recommendation of the management and prediction of further developments in the individual types of unreclaimed areas. According to the fact that unreclaimed areas represent the most varied set of habitats, furthermore having different areas and locations in the landscape, the endangerment and any difficulties arising out during succession reflect the specific situation

at the given location and are based primarily on the intensity of the primary human intervention, any toxicity of the substrate, etc., in addition to problems that are generally valid for the conservation of the site (ownership relations, economic pressure on subsequent use, etc.).

1. Creation of a new specific category - "study area" - in the framework of nature conservation, which would provide for the possibility of undisturbed, long-term scientific research of succession processes at selected localities of unreclaimed areas. Apply the results thus obtained to localities with similar character.
2. Directly formulated legislation towards effective reduction of economic pressure on purely utilitarian use of the landscape by human and proceed according to scientifically based plans of the landscape restoration methods in accordance with Article 8 of CBD.
3. Leave suitably selected non-cultural, sofar unreclaimed elements in the landscape to undergo spontaneous development or only slightly correct the process through carefully considered, minor, scientifically based interventions on the basis of scientifically based knowledge - according to the character of the territory through spontaneous or restrictively managed succession. Direct reclaiming towards the creation of a character of the site that would be as close as possible to the original structure of the habitat prior to human intervention.
4. Carry out research and monitoring of trends in the progress of the natural succession at the level of communities and populations of plant and animal species with emphasis on flexibility and variability of the biota. Monitoring of the progress of colonization and succession of the development of organisms would provide data on biotic interactions and niche differentiation in the species and genetic selection. Measure the ecological variables affecting the rate of decomposition and dying off of organic matter and also transport of substances in biochemical cycles and thus determine the causality of succession and individual instabilities.
5. Aware and educate the public about reclaimed areas in the landscape according to Article 13 of CBD.
6. Minimize the creation of further similar areas and extensive territories in connection with other units of the state administration, where the given habitat is assigned (agriculture, forest management, regional administration, etc.).
7. Prevent the introduction and subsequent spreading of invasive alien taxa to unreclaimed areas or secondly from these areas to the surrounding landscape on the basis of the results of the currently intensive research on non-indigenous flora and fauna in the CR. Always bear in mind the precautionary principle, Article 8 of CBD and also the Act No. 114/1992 Coll., on Protection of Nature and the Landscape.

## Related documents

Act No. 44/1988 Coll., on the Protection and Utilisation of Mineral Resources (the mining act), as amended  
Act. No. 61/1988 Coll., on Mining Activities, Explosives, and on the Government Mine Administration, as amended  
Act No. 114/1992 Coll., on the Protection of Nature and the Landscape, as amended  
Act No. 334/1992 Coll., on the Protection of the Agricultural Land Resources, as amended  
CBD COP Decision III/11 - Ecosystem approach



### I. Introduction

The purpose of identification and monitoring of biological diversity consists in observation of status, changes and their trends in its components and obtaining basic information for evaluation of measures and interventions adopted in the framework of various policies. Identification criteria and indicators are being developed in many areas to provide information on the relevant changes in the components of biodiversity, on the basis of monitoring. Evaluation of the developments of the biodiversity components is important from the conservation point of view; sustainable use is not possible without long-term data describing the natural variability of the biodiversity and also the impacts of environmental changes of global and regional extent.

Monitoring can be understood as a regular observation connected with evaluation of deviations from the set standards, established in the framework of the natural conditions in the specific region and related to the objectives of the monitoring. It is necessary to propose and verify a set of indicators for the purpose of evaluation of the effectiveness of measures adopted in the framework of the Convention, as well as for the purpose of identification and monitoring of the biodiversity components important from the conservation and sustainable use point of view.

Indicators are taken as instruments summarizing comprehensive information on the general state and trends in biodiversity and providing a framework for monitoring the objectives of the Convention and trends in the components of biodiversity. The basic purpose of proposing and testing indicators is expression of information on biodiversity in a quantitative, simple and comprehensible form. The indicators should be relevant in relation to policies influencing the use of biodiversity, sensitive to changes, easily analyzable and based on scientific models. A key aspect is the difficulty in collecting data, where it should be realistic to obtain the data required for proposing these indicators by relatively simple and reproducible methods. For assessment of biodiversity changes and their possible causes, indicators evaluating the status of biodiversity are insufficient, it is therefore necessary to develop indicators relating to biodiversity changes to stress, pressure and risk factors.

On the basis of the work of ad hoc technical expert groups, the Subsidiary Body for Scientific, Technical and Technological Advice of the CBD recommended the following indicators, which should be applied immediately<sup>5</sup>. These indicators are also used to obtain information on a national level and are intended to evaluate the state and trends in biodiversity. A total of 13 main indicators are currently used, of which 10 are relevant for the CR:

- (a) trends in extent of selected biomes, ecosystems and habitats;
- (b) trends in abundance and distribution of selected species;
- (c) coverage of protected areas (related to the area of the state);
- (d) nitrogen deposition;
- (e) water quality in aquatic ecosystems;
- (f) change in status of threatened and/or protected species;
- (g) trends in genetic diversity of domesticated animals, cultivated plants, and fish species of major socioeconomic importance;
- (h) numbers and costs of invasive alien species;

<sup>5</sup> UNEP/CBD/COP/7/INF/33: Provisional global indicators for assessing progress towards the 2010 biodiversity target. UNEP/CBD/SBSTTA/10/9: Indicators for assessing progress towards, and communicating, the 2010 target at the global level.



- (i) connectivity/fragmentation of ecosystems;
- (j) area of forest, agricultural, fishery and aquaculture ecosystems under sustainable management.

Further indicators should be regularly developed for endangered biodiversity, ecosystem services and balanced distribution of profits derived from the use of genetic resources.

**According to Annex I. of the Convention on Biological Diversity, especially the following components of biodiversity should be identified and monitored:**

1. Ecosystems and habitats: containing high diversity, large numbers of endemic or threatened species, or wilderness; required by migratory species; of social, economic, cultural or scientific importance; or, which are representative, unique or associated with key evolutionary or other biological processes;
2. Species and communities which are: threatened; wild relatives of domesticated or cultivated species; of medicinal, agricultural or other economic value; or social, scientific or cultural importance; or importance for research into the conservation and sustainable use of biological diversity, such as indicator species; and
3. Described genomes and genes of social, scientific or economic importance.



## II. Current Conditions

The EC Sustainable Development Strategy has set the objective of halting the biodiversity loss by 2010. This requirement was established in connection with the Implementation Plan of the World Summit on Sustainable Development (WSSD) in Johannesburg in 2002, which attempts to achieve more effective and more comprehensive implementation of all three objectives of the Convention and a substantial reduction in the rate of global biodiversity loss. Evaluation of these obligations is not possible without evaluation of current conditions, changes and trends in biological diversity on the basis of the existing, highly dispersed and sometimes poorly available information and systematic monitoring of trends in the decrease of the biodiversity components.

In the framework of the EC legislation, the obligation is imposed on the individual Member States to introduce a system of monitoring of components of biodiversity important from a European standpoint, represented by special types of natural habitats and species and subspecies of wild flora and fauna. Evaluation of the state of biodiversity on the territory of the CR is not possible without specification of components indicating changes in the biodiversity and subsequent coordination of monitoring and biodiversity information exchange.


In the framework of the CBD, principles were proposed for sets of indicators, used on a national scale by the individual Parties, and monitoring of biodiversity<sup>6</sup>. Although a great many international processes are being implemented to halt the biodiversity loss, so far there are no generally accepted procedures for monitoring and evaluation that could be used to measure and to assess biodiversity and its losses at the genetic, species and ecosystem level. The procedure of development of national indicators and monitoring includes particularly:

- (a) setting the appropriate problems and objectives,
- (b) proposing and testing suitable indicators,
- (c) development of a suitable monitoring programme, permitting access to verifiable objectives.

There are several monitoring programmes in Europe, coordinated particularly by international nongovernmental

<sup>6</sup> UNEP/CBD/SBSTTA/9/INF/7: Report of the expert meeting on indicators of biological diversity including indicators for rapid assessment of inland water ecosystems.

organizations. In some cases, these programmes provide relatively long time series on the development of the biodiversity components (e.g. for the bird populations and communities). However, in general the level of information on trends is insufficient and regular monitoring tends to be performed only rarely. The priority of monitoring is formulated in general in the State Environmental Policy, where one of the measures of research and development is to “formulate methods and indicators for monitoring and conservation of the environment and monitoring of long-term changes in ecosystems”.



### III. Problem Issues

1. There is a long tradition in biodiversity research in the CR, so that the components of biodiversity requiring conservation and having a potential for sustainable use have been identified. Similar to elsewhere in the world, however, the CR has been facing a lack of comparable long-term information on status, changes and trends in biodiversity and their causes (see the Research chapter).
2. In spite of previous attempts, there is no long-term, functioning, integrated biodiversity monitoring system in the CR. Nongovernmental organizations also currently participate in their own initiative in biodiversity monitoring, frequently utilizing the work of volunteers; the role of nongovernmental organizations and their potential contribution have, however, not been adequately evaluated and utilized. There is no system ensuring constant and suitable financing and continuation of these initiatives.
3. The State Nature Conservation and Landscape Protection Programme of the Czech Republic is concerned with research and development; nonetheless, no specific tasks follow from SNCLPP CR for the conception of monitoring, in contrast to the sectoral components of nature conservation (see the Communication and Education and Research chapters).
4. The consequences of this state of affairs are apparent: no regular summary reports are published on the state of nature and biodiversity in the CR, based on standard indicators, national statistics cover this area insufficiently and all this has a substantial impact on information exchange and, last but not least, on public awareness and education.
5. Monitoring is a priority also for forest, agricultural and water policy. So far, however, the various systems of biodiversity monitoring are insufficiently integrated in the framework of evaluation of forest ecosystems and of the impact of environmental measures and monitoring of the ecological condition of water bodies.



### IV. Objectives

1. Establish a system of compulsory monitoring of types of habitats and species pursuant to the Habitat Directive and, in connection with this, identify priority monitoring of additional areas, sites and species at a national level as well.
2. Propose and verify indicators for long-term evaluation of changes in biodiversity on the territory of the CR. The indicators will preferentially include especially areas recommended by the SBSTTA-CBD in relation to the basic EEA indicators and EC structural indicators. In developing indicators, utilize the already existing monitoring initiatives, including participation of nongovernmental organizations.
3. In the proposed Biodiversity Action Plan of the Czech Republic, prepare a system of implementation indicators evaluating the progress in implementing the objectives of the National Biodiversity Strategy of the Czech Republic and a schedule of evaluation of to what degree the objectives of the Strategy are achieved.
4. Establish a system of publication of reports based on indicators of the state of biodiversity in the CR,

especially in relation to providing reports for international multilateral conventions, organizations and the European Commission and incorporate selected indicators into national indicators and statistics.

5. Provide for long-term monitoring of developmental trends of the basic indicators of the state and changes in biodiversity, concerned with national trends in the set of basic indicators with the potential for also evaluating regional and local trends. Use the results especially for basic summary evaluation of the biodiversity state and trends at a national, regional and local level with the potential for comparison in the framework of the EC.

6. Establish a national biodiversity monitoring network with a central coordination institution, providing for long-term flow and evaluation of information in biodiversity in the CR, especially in the form of integrated monitoring of ecosystems, representing natural conditions and species biodiversity in the CR and representing biodiversity important from the standpoint of the EC. In addition to selected key indicators, monitoring will also be carried out of variables, characterizing in detail the state and developmental trends in the relevant terrestrial and water ecosystems.

7. Consistently monitor and evaluate the impact of economic actions, conservation programmes and management plans on the biodiversity. One of the objectives is to support synergies between monitoring programmes encompassing forest, agricultural and aquatic biodiversity.


### Related documents

CBD COP Decision III/10 - Identification, monitoring and assessment

CBD COP Decision V/7 - Identification, monitoring and assessment

CBD COP Decision VI/7 - Identification, monitoring and assessment

CBD COP Decision VII/8 - Monitoring and indicators: designing national level monitoring programmes and indicators



### I. Introduction

According to CBD, support for and stimulation of research contributing to the conservation and sustainable use of the components of biodiversity is an important step towards the biodiversity conservation. Although research in the area of biodiversity has been constantly developing, it is necessary to improve its scientific basis and increase support, as research information constitutes the basic condition for biodiversity conservation. There is insufficient interconnection between biodiversity research, the development of methods of conservation and sustainable use of biological resources and practical management in the landscape. This entire subject area lies mainly within the scope of the natural sciences; however, because it is not possible to ignore the fundamental impact of man on biodiversity, it is important not to lose sight of the economic and social aspects of the subject.

It is a great challenge to the scientific community to be able to provide results that can form the basis for making political decisions (e.g. providing access to the results of research for non-professional users) and that can be used for sustainable use of biodiversity at all levels, from the local or national to the global. For this process, it is important:

- 1) to commence high-quality, balanced, inter-sectoral cooperation, so that it is possible to formulate and resolve questions related to biodiversity in its total complexity. This cooperation should realistically formulate questions from identification of the extent and composition of biodiversity to management of biodiversity in the broadest sense of the word;
- 2) to modify or treat the results of research so that they constitute generally applicable information (flexible database), corresponding to the requirements of nature conservation and management and that can also be used for the work of the bodies of the state administration and for policy decisions in general;
- 3) provide this information for policy decision-making or to other sectors and factors;
- 4) increase intersectoral cooperation of ME, MRD and MA under the conditions in the CR.



### II. Current Conditions

Research in biological diversity in the Czech Republic is based on a long tradition and on well-established institutions concerned with development of scientific knowledge (universities, scientific institutions of the Academy of Sciences of the CR) and on storage of documents of local flora and fauna (museums, botanical gardens, scientific collections). Individual projects are financed by the Grant Agency of the CR and other sources. However, there is no framework programme concerned exclusively with biodiversity, in spite of repeated attempts to establish the National Centre for Biodiversity Research through the Ministry of Education, Youth and Sports programmes.

Current scientific knowledge on biological diversity in the Czech Republic has concentrated mainly on flora and fauna research, leading to the preparation and improvements of lists of species, knowledge of their distribution range and basic habitat requirements on habitat. This type of research has also led to diverse monitoring programmes. The structures of various guilds assemblages and communities have been studied, the character of

secondary succession in the anthropogenic landscape has been described and differences in the compositions of taxocenoses between various types of environments or geographic units have been characterized. In the future, scientific work should be concerned with better understanding of the historical roots and contemporary dynamics of biodiversity at the level of genes, species, communities and ecosystems. Particularly the genetic level of biodiversity and its historical development have been studied quite inadequately to date.

At the species level, there have been still a great many groups (especially among micro-organisms and fauna) about which even basic knowledge is not available in this country. In some cases, there is not even a reliable checklist of species occurring. It seems that the difference in the amount of knowledge available for the intensely studied and the neglected groups is becoming even greater.

Research in communities and ecosystems should concentrate on better understanding of the ecological role of the individual species and their functional ecological groups. Special attention should be paid to invasive alien species that have recently been spreading in this country and whose numbers and infested areas are increasing (see the Invasive Alien Species chapter). Although a considerable attention has been paid to invasive alien species of flora and fauna in the CR in recent years, it must be stated that basic knowledge is not available for even the common invasive vertebrates (e.g. the stone marten or the North American mink) on their food strategy or the extent of predatory and competition pressure exerted in relation to the indigenous fauna.

In addition to scientifically based research, Research and Development (R&D) projects are being carried out under the auspices of ME, e.g. the programme "The Environment and Conservation of Natural Resources" and "The Landscape and Settlements of the Future", financed from the budget of the Ministry. The main objectives include provision for dynamic renewal and development of research capacities in the CR using all the potential for international cooperation. The National Research Programme for 2004 – 2009 points out the necessity of improving and developing the relationships of the public to research and development.

Another activity is agricultural research primarily in plant or animal production and forestry. This consists of in both basic and strategic and applied research concerned primarily with conservation and effective use of natural resources (genepool, soil, water) and the biological potential of agro-ecosystems or forest ecosystems. This research is also concerned with improving the characteristics (e.g. increasing the resistance) of plants or animals, the quality and safety of foodstuffs, including evaluation of the benefits/risks connected with GMOs. This type of research is concentrated primarily at the level of species, provenance, varieties, etc. (see the Gene Bank chapter).

The Czech National Bioplatform (founded on December 5, 2003 <http://www.ibot.cas.cz/biop/index.htm>) is a new activity in the a mutual communication between scientists and focused on biodiversity and researchers policy-makers. This is a part of the European Bioplatform ([www.bioplatform.info](http://www.bioplatform.info)) and is intended primarily for communication and dissemination of information at a national and international level (especially in the EU).



### III. Problem Issues

1. The absence of a central data register on the distribution of species in the CR, effectively connected an international databases.
2. Inadequate coordination and records of research in bioindications and monitoring, lack of uniformed methodology.

3. Insufficient development of molecular phylogeography and research into the genetic variability within the natural populations and species and the related relative lack of funds for these activities.
4. The low interdisciplinary interconnection of research activities, weak interconnection of studies in contemporary biodiversity with the database of fossil record from the Holocene and Pleistocene.
5. Inadequate financing and ineffective distribution of available funds.
6. The absence of comprehensive grant programmes concerned with scientific research in the Central European biodiversity. Inadequate emphasis on the priority importance of study of biodiversity in the national sphere of science and research. Insufficient identification of the end users of research outputs.
7. Insufficient reaction to challenges from abroad, especially in the framework of the European Research area (Research Biodiversity Action Plan, ESF Programmes, Diversitas).
8. Absence of coordination and low level of assistance in research on biodiversity in the developing countries, inadequate implementation of the potential for taxonomic and field ecological research at Czech scientific and research institutions.
9. Taxonomically oriented projects are not adequately supported; basic taxonomic research (modern approaches using various types of data) is limited and underestimated.



#### IV. Objectives

1. Prepare a basic survey of the state of knowledge of biota in the CR and its individual components and identification of clear gaps in knowledge.
2. Adopt such strategies of balanced development of research work at universities and research institutions that would encompass all taxa with sufficient numbers and that are ecologically important.
3. Increase cooperation between botanists and zoologists, leading to the issuing of scientifically based standpoints for conservation and sustainable use of biodiversity.
4. Coordinate activities in cooperation with foreign activities, especially in the framework of the European research.
5. Direct the outputs of research so that this provides generally applicable information corresponding to defined nature conservation needs and requirements. In R&D for use by the state administration in the environmental sector, propose outputs of work in accordance with the needs for the work of the state administration authorities and policy-making decisions in general.
6. Inform the general public of the importance of applied research in biodiversity.
7. Establish an intersectoral programme that would facilitate interconnection of biological and social-economic research.
8. Develop basic taxonomic research.

## Related documents

Larsson, T. B., Catizzone, M.: Developing a European Biodiversity Research Agenda, [www.bioplatform.info](http://www.bioplatform.info)

Recommendations of the participants of the European Platform for Biodiversity Research Strategy meeting held under the French presidency of the EU in Montpellier, France 4 - 6 December 2000 concerning "Biodiversity research related to the "Biology of Invasions"

Recommendations of the participants of the European Platform for Biodiversity Research Strategy meeting held under the Swedish presidency of the E U in Sigtuna, Sweden, 11 - 12 June 2001 concerning "Biodiversity of Freshwater and Forest Science in support of the Ecosystem Approach"

Recommendations of the participants of the European Platform for Biodiversity Research Strategy meeting held under the Belgian presidency of the EU in Brussels, Belgium, 2 - 4 December 2001 concerning "Scientific tools for biodiversity conservation: monitoring, modeling and experiments"

Agreement of the participants of the European Platform for Biodiversity Research Strategy meeting held under the Danish presidency of the EU in Silkeborg, Denmark, 4 - 6 October 2002 concerning "Auditing the Ark - Science based Monitoring of Biodiversity"

Recommendations of the participants of the European Platform for Biodiversity Research Strategy Meeting held under the Greek presidency of the EU Lesvos, Greece, 23 - 26 May 2003 concerning "Biotic Resources in a Changing World: Science for Better Governance"

Recommendations of the meeting of the European Platform for Biodiversity Research Strategy held under the Italian presidency of the EU Florence, Italy 21 - 24 November 2003 concerning Genetic Biodiversity in Natural, Agricultural and Other Economically Used Systems: Measurement, Understanding and Management

Recommendations of the Working Group on Biodiversity research strategy in the Acceding and Candidate Countries European Platform for Biodiversity Research Strategy Bioplatform meeting in Poland in support of EPBRS Bialowieza, 5 - 9 July 2003

CBD COP Decision III/11, V/5, VI/5 - Agricultural biodiversity

CBD COP Decision IV/4 - Status and trends of the biological diversity of inland water ecosystems and options for conservation and sustainable use

CBD COP Decision VI/8 - Global Taxonomy Initiative

CBD COP Decision VI/9 - Global Strategy for Plant Conservation


CBD COP Decision V/4 - Progress report on the implementation of the programme of work on forest biodiversity

CBD COP Decision V/23 - Consideration of options for conservation and sustainable use of biological diversity in dryland, Mediterranean, arid, semi-arid, grassland and savannah ecosystems

CBD COP Decision II/9, VI/22 - Forest biological diversity


CBD COP Decision VI/23 - Invasive alien species that threaten ecosystems, habitats or species

Long term focus and support for the programmes of Science and Research in the CR - T3 - Support of the long term ensure of energy sources



## I. Introduction

Information on the state of biodiversity and the availability of this information constitutes a basic precondition for increasing the general public and target groups awareness of biodiversity. With the development of the global computer network, a considerable information on biodiversity is transferred particularly in electronic form. The obligation to exchange, provide and communicate information related to the conservation of biodiversity and sustainable use of its components from all available sources follows from Article 17 of the Convention on Biological Diversity. Exchange of information on biodiversity consists primarily in access to information on the results of scientific, technical and social-economic research, similar to the availability of information on research and education programmes (Art. 17 of the Convention). The **Clearing-House Mechanism of the Convention on Biological Diversity** (*CHM CBD*) was established for this purpose as a basic information instrument, intended to ensure exchange of information on biodiversity at a national level, in the framework of a certain part of the world (EU, Europe) and on a global scale.



## II. Current Conditions

In 2003, 37 information systems were in operation in the environmental sector, together with several thousand independent databases, established in the early 1990s without mutual coordination. The outputs from these information systems are not uniform and frequently no records are kept of them. The data storehouse of ME, the Centre for Public Information Services (CPIS) catalogue and a specialized metainformation system, which is part of the Unified Environmental Information System (UEIS), are intended to partly resolve this problem. In the framework of UEIS, whose administration and establishment is in the competence of the environmental sector, a national Clearing House Mechanism for the Convention on Biological Diversity is being created ([www.chm.nature.cz](http://www.chm.nature.cz)), coordinated by ANCLP CR, and the environmental web site in the framework of the Information Strategy of ME for 2004 - 2006.

From March 1, 2004, a PHARE twinning project was commenced with the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety of FRG (Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit - BMU). The main objective of the project is implementation of an integrated data model in accordance with the CENIA agency (Czech Environmental Information Agency - transformed Czech Environmental Institute). It is the task of this agency to provide for practical and detailed implementation of the EC legislation (and legislation at other levels) on the environment, i.e. centralized data collection and control, and evaluation of the effectiveness of all the environmental laws. CENIA will provide for exchange of data on the environment between national and regional administrations, reporting in accordance with the EC Directives and harmonization with the requirements of the EC legislation and the legislation at other levels. It will also be responsible for reporting on the state of the environment, preparation of analyses, policies, distribution of public information and provision of consultation to special-interest groups. The CENIA agency should also integrate the reporting on the environment, including indicators of sustainable development, and will establish conditions for data collection, with the objective of establishing a uniform information system in environmental protection, which will be used by both the state administration and the public.



On September 16, 2002, the Czech Republic signed a Memorandum of Understanding with GBIF (Global Biodiversity Information Facility), which is gradually becoming the main instrument in collection and provision of information on biodiversity on a global scale and is supported by OECD. GBIF, as an information metadatabase accessible through the internet, already has data available on the biological diversity of all the countries in the world, with the exception of the Vatican and San Marino.

### Three primary recipients of information support in the environmental sector

ME	CEI	SEF
Ministry of the Environment	Czech Environment Inspectorate	State Environmental Fund

### The expert and technical information base consists of 12 sectoral organizations (for the expert and information service)

- Agency for Nature Conservation and Landscape Protection of the CR – ANCLP CR
- CENIA (Czech Environmental Information Agency)
- Czech Geological Service - CGS
- Czech Geological Service - Geofund
- Czech Hydrometeorological Institute - CHMI
- Nature Conservation Administration - NCA
- Administration of the Krkonoše (Giant Mts.) National Park
- Administration of the Šumava (Bohemian Forest) National Park and Protected Landscape Area
- Administration of the Podyjí (Thaya River Basin) National Park
- Administration of the České Švýcarsko (Czech Switzerland) National Park
- Silva Tarouca Research Institute for the Landscape and Decorative Gardening
- TGM Water Research Institute – TGM WRI


### Nature Conservation Information System

The establishment of this system was made possible in 1996 by signing of the Framework Agreement between ANCLP CR, APLA CR (now NCA) and the administrations of the national parks. **Contents:** data on occurrence - in the form of storage of data on flora and fauna (occurrence) with their time and spatial location, habitat mapping (Natura 2000), information system for territorial systems of ecological stability, landscape management programmes, etc.

The conservation and use of agrobiodiversity and genetic resources of agriculturally utilized plants is fully provided for in the framework of the National Programme on Conservation and Use of Plant and Farm animal genetic resources and micro-organisms important for nutrition, agriculture and forest management. All the participants in the national programme and other users employ the National Information System designated EVIGEZ for documentation of genetic resources of flora and as a source of information (<http://genbank.vurv.cz/genetic/resources/>). In the framework of international cooperation (IPGRI – International Plant Genetic Resources Institute; ECP/GR – European Cooperation Programme /Genetic Resources), institutions in the CR further participate in the establishment and provision of services for international databases (Gene Bank at the Plant Production Research Institute (PPRI) in Prague: EWDB – European Wheat Database, The Grass Research Institute in Zubří: the European Arrhenatherum and Trisetum Database (ECP/GR) on the PPRI and AGRITEC, Šumperk servers: International Flax Database). European databases are available on the internet at the web pages: <http://genbank.vurv.cz/ewdb/> and [http://genbank.vurv.cz/arrh\\_tri/](http://genbank.vurv.cz/arrh_tri/).

The CR is cooperating in a FAO pilot project for monitoring the state of agrobiodiversity and implementing of tasks following from signing of the *Global Plan of Action (GPA – FAO)*; this project is concerned with the

development of an optimum format for monitoring genetic resources of agricultural crops and agrobiodiversity on a global scale. Through PPRI (Plant Production Research Institute), the CR is participating in the establishment of an *Early Warning System*, which is being implemented by FAO, to which the CR is contributing information on its territory.



### III. Problem Issues

1. The current state of the biodiversity-related databases is characterized by its variability in relation to terms of reference, methodology of data collection, mining and processing, quality of information and technical presentation, ownership and other rights.
2. The submission of reports for the sectors and implementation of obligations following from international multilateral agreements on the environment vary considerably and are not interconnected in the framework of the individual sectors.
3. There are no strategic terms of reference for NCIS based on analysis of the legislation, requirements of the public administration and informing the general public and target groups and containing strategic targets and priorities, and the Framework Agreement between ANCLP CR, Administrations of PLAs and the administrations of the national parks has not been implemented (organizational provision for establishment of NCIS, NCIS standards, rules for transfer of data) - divergence of information systems in the individual institutions of the State Nature Conservancy, heterogeneity of data, various ownership rights.
4. CHM has not been yet fully functional in the sense of the Article 17 of CBD and coordinators have not been appointed for the individual thematic areas.
5. There is low consciousness of the existence of CHM, lack of capacity for its implementation and subsequent promotion in the professional and general public, failure to implement obligations following from the Memorandum of Understanding with GBIF.
6. Most information sources are kept only in the Czech language.



### IV. Objectives

1. Establishment of an information policy in nature conservation and landscape protection - establishing a functional system integrating knowledge of specially protected and endangered organisms, their populations and state of the territory; with participation of all public research, expert and technical and administrative institutions (see SNCLPP CR).
2. Support for and development of the necessary technical, scientific and technological cooperation in conservation of biodiversity and sustainable use of its components through suitable international and national institutions (see the Article 18 of CBD) - cooperation, e.g., with GBIF or EEA, provision of and sharing of information in Czech and English, establishing suitable conditions for implementation of obligations raised from existing agreements.
3. Establishment of a nature conservation website (part of UEIS) - access to the individual information systems or organizations of the State Nature Conservancy - integration of various types of information sources (databases, information contained therein, documents, persons, organizations, services, procedures, etc.), implementation of the prepared central data model of the environment in nature conservation and landscape protection, providing access to data for the general public and target groups.
4. Appoint coordinators for the individual thematic areas of the CBD's CHM, which will participate in updating

and adding data to the metadata system, at a national and regional level, in accordance with the Decision of the Conference of Parties VI/18. Active involvement the CBD Committee in establishing CHM and its updating.

5. Interconnect CHM with the Biosafety Clearing-House.

6. Establish a national database of information on agrobiodiversity as an output of the FAO pilot project.

### **Related documents**

Agenda 21 - point 15.6

Convention on Access to information, public participation in decision-making and access to justice in environmental matters. - Aarhus convention

The State Nature Conservation and Landscape Protection Programme of the Czech Republic - point 4.2.2

State environmental polity - Point 5 - Information tools

Act No. 123/1998 Coll., on the Right for Access for Environmental Related Information

Act No. 106/1999 Col., on Free Access to Information

Article 17 of the Convention - Exchange of Information

Article 18 of the Convention - Technical and Scientific Cooperation

CBD COP Decision I/3 - Clearing-house mechanism for technical and scientific cooperation

CBD COP Decision II/3 - Clearing-house mechanism

CBD COP Decision III/4 - Clearing-house mechanism to promote and facilitate technical and scientific cooperation

CBD COP Decision IV/2 - Review of the operations of the clearing-house mechanism


CBD COP Decision V/14 - Scientific and technical cooperation and the clearing – house mechanism

CBD COP Decision VI/18 - Scientific and technical cooperation and the clearing - house mechanism

CBD COP Decision VII/23 - Scientific and technical cooperation and the clearing - house mechanism

Directive 2003/4/EC of the European Parliament and of the Council on public access to environmental information

Global Plan of Action (GPA - FAO)




### I. Introduction

Support for and stimulation of understanding of the importance of biodiversity conservation and sustainable use of its components are the main instruments to achieve the three Convention goals and to ensure effective implementation of the CBD. An important part of the public education and awareness is the promotion of biodiversity conservation through the mass media and support for integration of these subjects in educational and enlightenment programmes and in consulting. International cooperation should play an important role in these activities.

The global increase in electronic communication has provided new potential for promotion, support and understanding of the importance of the measures required for the CBD. The role of traditional means of communication should not be overlooked and emphasis is placed on their synergic action. An information system - CHM was established in the framework of CBD's implementation in the Czech Republic in 2003 to promote enlightenment and information exchange (see the Exchange of Information chapter). Its objective is to facilitate information exchange and especially provide access to a wide range of publications, monographs and reports on biodiversity through an on-line catalogue, which is globally available.

Nongovernmental organizations are important mediators in communication; throughout the world, they attempt to include marginal groups in the process of biodiversity conservation and sustainable development (Decision IV/10). An important component of CEPA consists of the right to information on potential damage to the environment and biodiversity by any industrial, construction, development etc. activity, especially for the population affected by such activities (potential for civic control, "knowing").



### II. Current Conditions

Since the beginning of the 1990s, environmental communication, education and public awareness (CEPA) has been holistically understood and steps to implement the objectives of the Strategy cannot be excerpted from this. This is implemented so that it leads to dissemination of an environmental way of thinking and acting, which is in accordance with the sustainable development principles, to an awareness of responsibility for maintenance of the quality of the environment and its individual components and to respect for life in all its forms (Act No. 17/1992 Coll., on the Environment, Article 16). Conceptual environmental education in the CR was first practiced in 1992, when the Government approved the Strategy of Support for Environmental Education for the 1990s. Communication, education and public awareness in the area of biodiversity are an important part of the State CEPA Programme and the Action Plan for 2004 – 2006 and one of the basic instruments through which the Strategy can be implemented. Implementation of the Action Plan is annually evaluated, including the effectiveness of the individual measures, and published as a special part of the Report on the State of the Environment in the CR.

ME has concluded intersectoral cooperation with MEYS, in the framework of which mutual support is provided for CEPA, based on the sustainable development principles and secured through state and non-governmental organizations. All the other bodies of the state administration and self-governing units should effectively

promote and provide information on these aspects. The State Environmental Fund supports CEPA through its subsidy programmes and projects. A clearly important potential is in zoological gardens, which gradually establish information and educational centres. Information centres are also gradually being established at the administrations of Protected Landscape Areas and National Parks. In recent years, there has been an increase in the importance of public discussion of the extent of Specially Protected Areas, their management and management plans.

A network of centres for injured and disabled animals has been established through non-governmental organizations, such as the Czech Union for Nature Conservation. The promotional activities of these centres act locally on important target groups – farmers, foresters, gamekeepers, children and adolescents. An important role is played by campaigns carried out, e.g., by some nongovernmental organizations, which explain to the public how to coexist with large carnivores, the importance of natural floodplain forests and the profits and benefits that natural species diversity provides for human beings through ecosystem services.

There are a number of nongovernmental organizations in the CR that actively participate in informing the public of biodiversity conservation. The greatest part of the work of environmental consulting centres in the STEP network (Environmental Consulting Centre Network - ECCN) focus on pro-active environmental management and in support to cooperation and communication between the key sectors in society - local administration, scientific research, the public and the business. Environmental consulting is intended to provide the public with objective and comprehensive information on the environment, on environmental problems and their resolution, on products and their impact on the environment. Environmental consulting thus contributes to the formation of the environmental awareness in the population and establishment of civic structures that act as a counter-balance to one-sided political or economic decision-making.

Children and students are an important target group; a wide range of educational programmes and hobby leisure groups have been established for them and thus the subject of biodiversity conservation is slowly entering education programmes. The largest organizations include the PAVUČINA (Spider's Web) Association of Environmental Education Centres and the Environmental Education Club. Their activities include not only education among children, but also development and support to the network of teachers and lecturers, schools and other institutions dealing with CEPA issue. According to these associations, the objective of environmental education is to awaken and reinforce a harmonic relationship between humans and the environment, all living beings and other people, and thus find a pathway to oneself. Direct contact with nature and natural materials is an important component in this respect.

Museums have a long history in the Czech Republic and have traditionally been concerned with education in environmental management and nature conservation. However, museums do not only contribute to CEPA directly, i.e. through their natural science institutions, but especially through the fact that they present a changing world in its various forms and interconnections.



### III. Problem Issues

1. Decreasing interest of the general public in the environment, low biodiversity knowledge, lack of consciousness of the importance of biological diversity for human beings, the position of man in the environment.
2. Inadequately elaborated procedure for promotion and “advertising” in nature conservation. The area is not attractive for sponsoring and investments. There are no adequate and suitable opportunities in the public mass

media for nature conservation and sustainable development.

3. There is insufficient financial provision and mechanisms for providing information on biodiversity.
4. The existence of developmental plans that directly endanger species diversity (trans-European transport networks, constructions and building-up in the open landscape, synurbanization, etc.) and the potential for their financing from the EU sources. The promotion of investment plans is accompanied by massive media and lobby campaigns in support of the construction, mining, etc.
5. The anthropogenic approach in policy documents and policies (the State Environmental Policy, the Sustainable Development Strategy of the CR), anthropocentric to technocratic attitudes of politicians in biodiversity conservation (“A rabbit must not be preferred over a skier”, “Restrictions on economic development in regions with high unemployment in the name of a newt”).
6. The employees of the state administration are inadequately informed and they are sometimes still technocratically oriented. Environmentally sound behaviour and attitudes of the employees of the public administration during the working process, environmentally sound operation of authorities, saving natural resources is still not a matter of fact.
7. There is inadequate systematic and effective informing, participation and active influencing of the public leading to environmentally sound behaviour. There is a lack of motivation for this behaviour.
8. The effectiveness of communication, education and public awareness is evaluated only quantitatively (number of events, teaching programs, “child-hours”, etc.) and not qualitatively, i.e. there is no monitoring of the professional accuracy of the information provided and especially the final impact of CEPA on the clients as a feedback.
9. Unimplemented environmental tax reform, lack of a stable framework for financing nongovernmental organizations in environmental management.
10. The professional level of some outputs from CEPA is not always adequate, so that these actions can even be counter-productive.



#### IV. Objectives

1. Increase the availability of information on biological diversity.
2. Introduce specific programmes for public participation; teach politicians about nature conservation and biodiversity and why they are critical and essential human beings.
3. Consistently evaluate and, as required, update measures that are part of already adopted programme, strategies, action plans and sectoral policies and their impacts, from the standpoint of implementing the Strategy - in particular:
  - The CEPA State Program; CEPA Action Plan for the individual periods; State Environmental Policy, State Nature Conservation and Landscape Protection Programme; sectoral policies (energy, raw material, transport, water).
4. Conclude an intersectoral agreement on cooperation between ME and MA on cooperation in CEPA and implementation of the National Biodiversity Strategy of the Czech Republic.
5. Conclude an intersectoral agreement on cooperation between ME and MC and the founders of museums on cooperation in CEPA and promotion of the objectives of the Strategy.
6. Use the functioning network of CEPA centres and announce public competitions and subsidy programmes each year on the basis of funds from ME, MEYS, MC and MA for implementation of the National Biodiversity Strategy of the Czech Republic.
7. Prepare and implement a module of initial and life-long education in “Biodiversity Conservation” for education of priority target groups (employees of the state administration, representatives of local governments, managers in agricultural, forestry and water management companies and firms, staff members and activists in

nongovernmental organizations and project planners).

8. Introduce functioning financial mechanisms for promotion and informing the public of aspects of biodiversity conservation (Decision IV/10).

### **Related documents**

The Czech Republic Government Resolution No. 1048 of 23 October 2000 on State Programme of Environmental Education and Public Awareness in the Czech Republic

The Czech Republic Government Resolution No. 991 of 8 October 2003 to implement Government Resolution 1048/2000 on the State Programme of Environmental Education and Public Awareness in the Czech Republic  
Action Plan on the environmental education and public awareness programme in the Czech Republic for 2004 - 2006

Act No. 123/1998, on the Right for Access to the Environmental Related Information, as amended by the Act No. 6/2005 Coll.

Inter ministerial agreement on cooperation in the field of the Environmental Education and Public Awareness between the MoE and the Ministry of education, youth and sport


Draft UNECE Strategy for Education for Sustainable Development

Aleš Máchal - Průvodce praktickou ekologickou výchovou, Rezekvítek Brno 2000, ISBN: 80-902954-0-1

CBD COP DecisionV/17 - Education and public awareness

CBD COP DecisionVI/19 - Communication, Education and public awareness

CBD COP DecisionVII/24 - Education and public awareness (Article 13)



## I. Introduction

Biodiversity is positively and negatively affected by all human activities. Consequently, it is necessary to effectively use the instruments and methods of environmental policy (educational, economic and legal, voluntary, informative, public participation, institutional, etc., SEP), especially in dealing with the following aspects:

- a) at a macro-economic level, for evaluation of the qualitative aspects of economic, social and environmental development;
- b) at the level of state regulation, economic instruments and methods should be employed to promote processes that are favourable for biodiversity and, on the other hand, to obstruct processes that endanger or reduce biodiversity;
- c) in the evaluation of specific policies, programmes, projects and events, economic evaluation (valuation) of their benefits and negative impacts on biodiversity using economic instruments and methods;
- d) in connection with the above, employ economic instruments and methods so that economic calculation of damage or improvement of the environment (and thus also biodiversity) is included in the costs or revenues of those economic entities that are responsible for the biodiversity change.


However, the use of economic instruments must not be considered separately, it is always necessary to use an “instrumental mix”, which will not only include economic instruments but will also take into account other instruments and measures.

Definition of the relationship between the economy and biodiversity follows from key international documents. The obligation of the contracting parties to adopt economic measures that will have a favourable impact on the biodiversity and contribute to sustainable use of its components arise out from the Article 11 of the Convention. It follows from the EC strategy that economic instruments such as, e.g., subsidies, taxes and various fees, can have a considerable effect on biodiversity. They can sometimes be used to influence production and consumption so that they are beneficial to biodiversity. The EU supports methods through which the informed consumer can decide independently on behaviour that will be beneficial to nature conservation and sustainable use of biodiversity. Where possible, the EU intends to ensure that:

- a) biodiversity is taken into consideration in economic issues;
- b) environmental criteria are taken into account for the entire lifetimes of products whose production, distribution or disposal could affect the biodiversity;
- c) the standpoint of biodiversity also becomes part of responsibility.

In addition to identification and introduction of instruments that are beneficial for nature conservation and sustainable use of biodiversity (“*incentive measures*”, *CBD*), it is necessary to also eliminate mechanisms that are detrimental to biodiversity: (“*perverse incentives*”, *CBD*). These include, e.g., some unsuitable relationships and utilization of the rights to agricultural and forest land, the manner of concluding lease contracts, procedures in international trade and economic policy. Consequently, every relevant strategy should employ instruments that would be beneficial for nature conservation and sustainable use of biodiversity and to promote systems that will be acceptable from the economic and social standpoints and will simultaneously be beneficial for biodiversity. Mechanisms with detrimental impact on sustainable use of biodiversity should be reduced or completely eliminated.





## II. Current Conditions

There are currently various types of economic instruments in the Czech Republic that can have a favourable impact on biodiversity in the above sense. These instruments are categorized and described in the “OECD Classification” (e.g. *Recommendation of the Council on the Use of Economic Instruments in Promoting the Conservation and Sustainable Use of Biodiversity, OECD, 2004*). From the standpoint of motivation of entities to conserve and increase biodiversity, these instruments can be divided into **instruments of positive stimulation** (subsidies, support, exemptions, etc.) and **instruments of negative stimulation** (taxes, fees, sanctions). Another group consists in **market conformable instruments** – e.g. trading in permits for emissions of greenhouse gases (Act No. 695/2004 Coll., on conditions for trading in permits for emissions of greenhouse gases and amending some Acts), ecolabelling and voluntary activities of business entities. The effect of these instruments on biodiversity is not monitored separately.

**Instruments of positive stimulation** (motivation instruments) include, e.g., the individual landscape management programmes (e.g. the Landscape Management Programme and the River System Restoration Programme) and support from the State Environmental Fund of the CR.


**Instruments of negative stimulation** include fees for pollution of the individual components of the environment (e.g. fees for discharge of polluted water into surface waters), sanctions for illegal interventions and distribution into nature (e.g. fees for illegal felling of tree species) and payments for withdrawal of agricultural and forest land from its purpose.

The financing of measures to conserve and increase biodiversity is considered to be an independent aspect. At the present time, activities for biodiversity conservation and sustainable use of its components in the CR are financed from domestic and foreign sources. Domestic financial sources include the state budget, the State Environmental Fund, regional and municipal budgets, foundations and sponsor donations. The **European Structural Funds** are an important source of foreign support. The Czech Republic regulates the use of these funds through its programme documents. The **Horizontal Rural Development Plan** (HRDP) is a programme document that could be utilized to support activities on management of nature and the landscape. **Agri-environmental schemes** are an important instrument in nature conservation (if their environmental effectiveness is regularly checked and monitored), where agricultural entities pledge to employ a certain environmentally sound farming method for a period of five years.

Other programme documents include, e.g.: the **Infrastructure Operation Programme** and the **Agriculture Operation Programme**, some of whose measures are also concerned with affecting the means of management from the standpoint of the interests of sustainable development, support for rural areas and conservation of nature and the landscape, which can be subsequently reflected in a qualitative improvement in biodiversity. The **LIFE Programme** is an important initiative of the European Union and is intended for financing projects contributing to conservation and management of the environment. One of its parts, Life-Nature, is an especially important initiative from the standpoint of nature conservation and the landscape protection, as it permits, e.g., financial support for projects in the Natura 2000 sites.


The State Environmental Policy of the Czech Republic in general emphasizes strengthening of the partnership between the public and private sectors. The private sector is gradually being accepted as an essential partner in biodiversity conservation. Government Resolution No. 7 of January 7, 2004 on the Policy of the Government of the Czech Republic in the area of partnership of the public and private sectors is important in this respect.

Some important components of biological resources are privately administered or are subject to intellectual property rights (especially biochemical extracts and genetic resources); mostly, however, biodiversity is considered to be a public property. Consequently, methods of evaluation and valuation of various components of biodiversity are being developed internationally and in the CR.



### III. Problem Issues

1. Property and access rights to the individual components of biodiversity are not adequately defined, which complicates market evaluation of biodiversity and the establishment of a market for conservation of specific forms of biodiversity and sustainable use of its components.
2. The procedures for evaluation of biodiversity at all levels have not been clarified and there is a lack of modification both according to the purpose of the evaluation and according to the specific biodiversity components.
3. The methods based on the theory of natural capital and its evaluation have not been adequately elaborated to the level of useful macroeconomic indicators. No suitable information system and system of indicators that would express the state and changes in biodiversity in the territory of the CR has been established.
4. There is a lack of studies of the value of biodiversity, related to biotechnical, agricultural and forest products, pharmaceuticals, decorative plants, etc, similar to the impacts of the use of biodiversity on the ecosystem functioning.
5. The private sector is not frequently seen as a partner for biodiversity conservation and sustainable use of its components. While existing instruments allow the private sector to invest into biodiversity conservation and sustainable use of its components, no suitable partnership has been established between the public and private institutions, or between the other stakeholders. An organizational, institutional, legislative and administrative basis has not been established for cooperation between the public and private sectors.
6. The currently used fees serve primarily the purposes for which they were introduced and also, in this connection, for biodiversity conservation. They are not systematically directed in relation to biodiversity conservation and frequently do not stimulate desirable behaviour. It should be emphasized that fees are only one of the instruments and that public budgets are of primary importance.
7. A system of elaboration and monitoring of the effectiveness of the implemented measures and the effectiveness of investments into biodiversity conservation has not been developed. A uniform system of indicators for assessment of the state of biodiversity has not been introduced (see the Monitoring and Indicators chapter).



### IV. Objectives

1. Propose modification of the relevant, currently existing, environmental economic methods and instruments so that they lead to the greatest biodiversity conservation and sustainable use of its components.
2. Propose a structure and substantive form of new fees supporting conservation of the components and elements of biodiversity. Re-evaluate existing financial instruments and find new economic incentives for management of biodiversity.
3. Submit a proposal for financial mechanisms for biodiversity. Further develop cooperation with international financial organizations with the possibility of utilization of their funds for financing programmes for biodiversity conservation.

4. Include a wide range of partners in biodiversity conservation and establish partnership of the public, nongovernmental and private sectors.
5. Introduce a system of monitoring and indicators of the effectiveness of investments into biodiversity conservation and sustainable use of its components and especially of all programmes implemented in nature conservation and landscape protection under the competence of ME.
6. Propose corresponding procedures for evaluation of the direct and indirect benefits following from biodiversity and its use under the conditions in the CR, including application procedures and methods of their use. Create a hierarchical system of indicators and information that would permit the use of all the available economic methods of evaluation of economic-environmental programmes, projects, events and measures.
7. Regularly evaluate the implementation of the Strategy through defined indicators and evaluation methods.

### **Related documents**

Act No. 695/2004 Coll., on Conditions for Business Under the Emission Trading Scheme

Recommendation of the Council on the Use of Economic Instruments in Promoting the Conservation and Sustainable Use of Biodiversity, OECD, 2004

The Czech Republic Resolution No. 7 of 7 January 2004 on the Czech Republic Policy in the partnership in the area of business and private sector

Handbook on Market Creation for Biodiversity, Chapter 1. - 9., OECD, 2004



## B

# BIODIVERSITY IN SECTORAL AND AREA POLICIES

## I. Agriculturally Managed Ecosystems

### I. Introduction

Agricultural management in the Czech Republic is similar to the practice throughout Europe, where more than 40 % of land is used for agriculture and more than one half of the European Community budget is allocated for the Common Agricultural Policy, which is among the most important factors affecting biodiversity in the EU Member States. Agriculturally managed ecosystems contain important components of biological diversity that are important in providing for production of foodstuffs, functioning of ecosystems and safe life. Sustainable use forms a basis for preservation of the biodiversity of agricultural ecosystems. (Decision IV/6). In relation to the global growth of the human population, intensive technologies and procedures have recently been introduced, with the aim of increasing agricultural production for nutritional needs. Agricultural activities have caused destruction or transformation of certain important habitats, such as wetlands, as well as eradication of a number of habitats and reduction of sources of food for a number of species occurring in agricultural ecosystems.

In conformity with the EC Biodiversity Strategy, we are aware of the importance of agricultural use of land, selection of management approaches, as well as the socio-economic situation of the rural areas (local population) for maintaining or improving biodiversity for future generations. The objective of the CBD thematic programme of work on agricultural biodiversity should include, without limitation, support for favourable and elimination of unfavourable impact of agricultural activities on biodiversity.

### II. Current Conditions

During the last decade, the area of arable land in the Czech Republic slightly decreased in favour of grasslands (3 % of agricultural land) and forests (0.1 % of agricultural land), either through spontaneous succession or targeted planting. 7 % of agricultural land is currently endangered by abandonment and, without any state subsidy policy, management of this land is not economically viable. This land includes particularly wetlands, steppe grasslands (see the Grassland Ecosystems chapter) and sub-mountain grasslands with high species diversity.

With substantial contribution of unsuitable technological approaches, the ratio of land endangered by water erosion (almost 42 % of agriculturally managed land is included in the categories from endangered to most endangered land) remains high, which also directly affects the state of aquatic ecosystems biodiversity (see the Inland water and Wetland Ecosystems chapter).

For economic reasons that led to a marked decrease in the quantity of used fertilizers and means for plant protection in the early 1990s, a repeated slight increase has been witnessed in recent years and it is likely that the quantities could grow in connection with acceptance of the standards of the EU Common Agricultural Policy.

In the early 1990s, the Czech Republic introduced management within a sound and sustainable system of certified organic farming. The regime of organic farming is currently employed on approximately 5 % of agriculturally managed land and organic farming is supported from public funds.

Both the occurrence and quantity of specimens of wild flora connected with farming that were common in the 1950s, such as the corncockle (*Agrostemma githago*), pheasant's eye (*Adonis aestivalis*), cornflower (*Centaurea cyanus*), shepherd's needle (*Scandix pecten-veneris*), rye brome (*Bromus secalinus*) or darnel ryegrass (*Lolium temulentum*), and wild fauna, such as grey partridge (*Perdix perdix*), brown hare (*Lepus europaeus*), European souslik (*Spermophilus citellus*) or lapwing (*Vanellus vanellus*), have continued to decrease. The structure of soil remains affected to a degree that mostly does not permit long-term survival of soil organisms, particularly annelids and arthropods.

Several hundreds of extensive orchards consisting particularly of fruit trees have been maintained; however, these orchards gradually disappear and their further maintenance will be impossible without any state subsidy policy. Similarly, certain traditionally kept farm animals breed are also endangered (see the Gene Banks chapter).

Extensive areas of valuable properties in open landscape are owned by the State, which allows for stipulating rules of sound management within the applicable lease contracts. On average, 90 % of land used by farms is leased; returning of land to the original owners is proceeding slowly.

The Concept of Agrarian Policy of the Czech Republic for the Period After Accession to the EU (2004 – 2013) (CARP), the State Environmental Policy of the Czech Republic and the State Nature Conservation and Landscape Protection Programme of the Czech Republic have initiated changes resulting in improvement of the current conditions; however, these changes are not adequate to fulfil the European target – halting the biodiversity loss by 2010.



### III. Problem Issues

1. **The landscape structure has been damaged.** During the second half of the 20<sup>th</sup> century, the extent of managed areas (through blocking of land) substantially increased, important landscape features were destroyed (hedgerows, hedges, rows of trees, extensive orchards, solitary trees, bushes, wetlands), and floodplain meadows and other meadows and pastures with high species diversity were cultivated and drained. In Specially Protected Areas, the structure of the landscape has not been affected to a degree common in areas more suitable for production. Valuable habitats of wet meadows, steppes and sub-mountain meadows rich in species are endangered by and abandonment.

2. **The landscape does not provide suitable living conditions for wild fauna and flora.** Unified farming characterized by extensive mechanized harvesting of crops on arable land and haymaking on meadows within short periods, and low diversity of grown crops and bred species and breeds of farm animals reduce the potential for reproduction, the sources of food and the potential for providing refuge and shelter.
3. **Valuable habitats, rare and endangered species of fauna and flora in agriculturally managed landscape, soil and aquatic ecosystems are degraded by unsuitable technological farming approaches.** The manners of fertilizer application and means of plant protection, as well as their quantity and type, the systems of utilization of meadows, machine mowing from edges to the centre and use of heavy machinery substantially affect biodiversity, also in agriculturally non-managed areas (e.g. aquatic and wetland ecosystems).
4. **Grasslands are endangered by succession.** The farm animals numbers do not correspond to the area of grasslands. The quantity of biomass from grasslands is excessive. A substantial decrease has been observed in the numbers of sheep and goats in the past, which are suitable species of farm animals for grazing in valuable habitats, such as steppes (see the Grassland Ecosystems chapter), hardly accessible sloping pastures with high species diversity (see the Mountain Ecosystems chapter) and peat bogs.
5. **Biodiversity of agriculturally managed ecosystems is endangered by spontaneous spreading of invasive alien species and intentional introduction of non-indigenous species of fauna and flora.** Invasive alien species, such as the giant hogweed (*Heracleum mantegazzianum*) and knotweed (*Reynoutria spp.*), endanger particularly habitats adjacent to water courses and bodies. Intentional growing of non-indigenous, energy-production plants, in cases where it has not been verified that they will not spontaneously spread outside the grown culture, constitutes a potential risk for biodiversity.
6. **Use of genetically modified organisms (GMOs) constitutes a potential risk for biodiversity.** Knowledge of the impact of the use of GMOs on the local biodiversity remains inadequate and does not allow to make generally valid conclusions. In case of potential crossbreeding of GMOs with native species and naturally improved cultivars, important adaptations of the indigenous species to local conditions could disappear.
7. **Traditional regional crop varieties and farm animals breeds are endangered.** Maintaining the traditional varieties and breeds is fundamental for maintaining the potential of natural resources in the future (see the Gene Banks chapter).
8. **The ownership titles to land and the legal position of its users, as well as the size of farms, are based on former co-operative farming.** In most cases, major entities without an ownership title which employ the individual farmers do not provide suitable conditions for restoration the relationship between the farmers and land. Approximately 76 % of agriculturally managed land is used by 1885 enterprises managing over 500 hectares. The farming activities of these users pose the risk of their orientation on short-term profits to the biodiversity degradation on the leased properties.



#### IV. Objectives

1. Maintain farming on existing grasslands; particularly in habitats belonging to the Natura 2000 network (see CARP).
2. Promote and support environmentally sound farming (see SEP, CARP) characterized by high heterogeneity (technological approaches, quantity, type and application of fertilizers and plant protection preparations, sowing procedures, etc.). Encourage such technologies that, not only increase productivity, but also reduce degradation as well as restore and enhance biodiversity. These could include, inter alia, organic and integrated farming, integrated pest management, biological control and suitable harvesting methods (Decision III/11).

3. Encourage restoration and creation of ecologically important landscape features (hedges, hedgerows, line and non-forest greenery, grasslands, especially floodplain meadows, etc.).
4. Encourage maintenance of traditional crop varieties and farm animals breeds.
5. Encourage farming by minor entities and enhance the capacity of local and owners of land and rural communities for sustainable use of biodiversity on agriculturally managed land and promote public awareness (Decision V/5).

### **Related documents**

The Czech Republic conception of the agrarian policy for the period after EU accession (2004 - 2013)

CBD COP DecisionV/5 - Agricultural biological diversity: Review of phase I of the programme of work and adoption of a multi-year work programme

CBD COP DecisionIII/11 - Conservation and sustainable use of agricultural biological diversity

CBD COP DecisionIV/6 - Agricultural biological diversity

CBD COP DecisionVI/5 - Agricultural biological diversity

CBD COP DecisionVII/3 - Agricultural biological diversity

IUCN – Countdown 2010 [www.countdown2010.net](http://www.countdown2010.net)





### I. Introduction

The Convention defines the forest ecosystem as a dynamic complex of plants, animals and micro-organism and their non-living environment interacting as a functional unit, in which trees are a key component of the system.

The interest of global society in maintaining and improving the state of forests, as the habitats holding the vast majority of terrestrial species of wild flora and fauna (Decision II/9, Art. 4 of the Annex) is based on a number of COP decisions and SBSTTA recommendations. As an instrument for implementation of the CBD, the Contracting Parties agreed at the sixth meeting of the Conference of the Parties on an extended programme of work aimed at research, cooperation and development of technologies that are important in relation to conservation and sustainable use of the components of the species diversity in all types of forests.

The global process aimed at the forest protection is also the subject of the UN Forum on Forests which was established in October 2000 with the objective to promote the management, conservation and sustainable development of all forest types. In the EU, the forest biodiversity conservation is dealt with by the Resolution of the EU Council on the EU Forestry Strategy. An important initiative in the process of cooperation between the European countries consists in the Ministerial Conference on the Protection of Forests in Europe (MCPFE). The National Forestry Programme, adopted by the Resolution of the Government of the Czech Republic No. 53 of 2003, was drawn up on the basis of the conclusions of the 3rd Ministerial Conference held in 1998 in Lisbon.

The legislative framework for utilization of forest properties and management of forests of the Czech Republic is provided for in the Act No. 289/1995 Coll., on Forests, as amended, and Act No. 114/1992 Coll., on Protection of Nature and the Landscape, as amended.



### II. Current Conditions

The potentially dominant proportion of forest communities in the Czech Republic is based particularly on the character of the European climate and underlines the importance of forests as an important feature in species diversity. Due to the considerable variability of habitat conditions, together with the geographic position of the Czech Republic, which territory is influenced by several phytogeographical areas, a wide range of forest types have developed in a relatively small area where it is affected by the vertical differentiation of the territory (forest vegetation zones), geological and pedological effects and presence or availability of water in the landscape (edaphic categories and ecological series).

The current area of forests on the territory of the Czech Republic slightly exceeds 1/3 of the whole country area. In spite of unfavourable factors, particularly anthropogenic, to which the forests are exposed, the proportion of forest areas has gradually increased since the beginning of the 20<sup>th</sup> century. During the recent years, reduction in agricultural use of the landscape, with subsequent afforestation of uncultivated properties, has substantially contributed to the increasing trends. The **State** is the majority owner of forests in the Czech Republic; it **manages 60.5 % of forest land**. Other owners of forest stands include municipalities and regions (15.3 %), forest co-operatives (1 %) and individual private owners (23.2 %).

According to the main functional objectives, the Forest Act defines three basic categories of forests. **Economic forests** fulfil particularly the productive functions and cover **75.6 % of the area of forests**. The categories of **protective forests (3.5 %)** and **special-purpose forests (20.9 %)** provide primarily other functions of forests, which are summarily entitled as non-productive functions. The general trend aimed at conservation of biodiversity and sustainable use of its components is directly reflected in promoting poly-functional management of forests. Its objective is to manage forests in a manner facilitating optimum performance of all the functions. The categories of poly-functional forests are also dealt with in the above National Forestry Programme.

The attempts to increase production, together with the growing demand for readily workable types of coniferous timber, resulted in a change in the species composition of a vast majority of forest stands. The current **proportion of broad-leaved trees equals 23 %**, where **the natural proportion would be approximately 65 %**. Replacement of the natural, structurally rich forests with high diversity of species by plantations of the same age, consisting frequently of a single species, together with underestimation of the importance of the provenience and genetic value of seeds or planting materials, constituted a drastic intervention in the ecosystems. The extensive transition to open, particularly the extensive clear-cutting, accelerated the process of reduction in the forests species diversity, *inter alia*, by entire elimination of the stages of ageing and decomposition of stands on which numerous species of lower and higher plants and representatives of a number of taxonomic groups of animals are bound.

Transformation of broad-leaved or mixed stands to purely coniferous forests initiated changes in the soil manifested by a change in the humus forms, reduction of organisms living in soil and, depending on the conditions, often also forest land degradation. Excessive pollution levels, extreme precipitation and temperatures, as well as plague, particularly in economically important species of insects, finalized the process of destabilization of forest ecosystems by extensive decomposition of stands at a great many sites. Although the direct effects of pollution on forests has been substantially reduced during the last 15 years and, *de facto*, became a less important stress, the remediation of its consequences, particularly improvement of the state of acidified forest soils containing insufficient nutrients, will require a longer period of time. Similarly, at least partial remediation of the unsuitable species composition in fully transformed forest stands will be an issue for the coming decades, depending on the relatively long life of trees. In this regard, it should be noted that implementation of Act No. 289/1995 Coll., on Forests (Forest Act), brings about a marked shift towards a gradual increase in representation of natural species.


Forests located in the network of Specially Protected Areas (SPAs) and their irreplaceable role, not only as refuges for numerous species of organisms, but also as the subject of study of natural dynamics of development of these communities, must not be neglected in forest biodiversity conservation and restoration.



### III. Problem Issues

1. Forest biodiversity conservation is not adequately incorporated in the legislative framework of the Czech Republic. The fact is also reflected in the individual sectoral policies.
2. The current system of protection of the gene pool is concerned particularly with economically important tree species. For rare tree species, bushes, endangered species of the herbaceous level and other components of the forest ecosystem, the conservation methods of their gene pool have not been developed.
3. The continuing high proportion of tree stands of single age consisting of a limited range of economically most profitable, particularly coniferous tree species.

4. In spite of long-term monitoring of forests that have been exposed to air pollution, particularly in the past, the issue of long-term impact of the given aspect on the soil has not been entirely resolved to date. Thus, it is still not possible to adequately evaluate the effectiveness of measures adopted to support restoration of acidified forest land.
5. The methodology of monitoring changes in the condition of species diversity of forests, including the methods of describing the current or favourable condition and the methods of evaluation of impact of external effects, such as the climate change, spreading of invasive species, change in management measures, etc. has not been developed to date.
6. From the viewpoint of CBD implementation, the need for a marked increase in awareness of the general public, as well as target groups, of the aspects of conservation of forest ecosystems and forest biodiversity is not adequately taken into account in relation to the commitments following from the provisions of the applicable laws and international multilateral environmental agreements.



#### IV. Objectives

1. Maintain or increase the current forested area as a minimum basis for ensuring the needs of forest biodiversity conservation, while maintaining all other forest functions.
2. Enact alternative methods of drawing up the forest management plans on the basis of operational inventories, as an instrument of encouraging transition to environmentally sound management methods. At the same time, elaborate and introduce to daily practice a new draft system of forest categorization based on the concept of forests as poly-functional ecosystems, and introduce the required incentives so that the measures necessary for conservation of biodiversity are economically acceptable for forest owners.
3. In renewal of forest stands, ensure proportion of tree species belonging to the natural species composition (NSC) in economic forests, as least within the limits of the current statutory percentage of amelioration and compacting tree species and, by suitable instruments, promote the use of NSC species over and above the minimum framework. At the same time, provide for a certain proportion of ageing and dead trees in forest stands as refuges for communities of organisms bound on such trees.
4. Adopt measures to increase the proportion of natural renewal of forest stands that are suitable from the viewpoint of species and genetic aspects. This is closely related to the need to adopt suitable measures to reduce the numbers of ungulate game and then maintain these numbers at a level which does not prevent natural renewal of forest stands.
5. Apply principles of the ecosystem approach in the use of the components of forest biodiversity. This includes, *inter alia*, protection of the gene pool of endangered species of lower and higher plants, individual communities of wild fauna (zoocenoses), forest land and its natural water regime, also including other, e.g., socio-economic aspects of the given subject.
6. Using the results of research carried out to date and the outcomes of monitoring of the effects of pollution levels on forests and forest land specify the current problems related to forest ecosystems restoration in areas that have been exposed to higher pollution levels, particularly in the past. At the same time, draw up a concept of further procedure in alleviating the impact of unfavourable processes on forest biodiversity.
7. Using the outcomes of research tasks that have already been commenced, finalize the methodology of describing the state and monitoring of biodiversity of forest ecosystems and consider the possible incorporating of the national forest inventories in the nation-wide system of monitoring biodiversity, *inter alia*, in relation to Regulation (EC) No. 2152/2003 of the European Parliament and of the Council of 17 November 2003 concerning monitoring of forests and environmental interactions in the Community (Forest Focus). Further develop the network of forest SPAs left to spontaneous development, resolve the issue of a reference network of monitored

natural forests left to spontaneous development including the methodology of their monitoring, and finalize the preparation of the database of natural forests.

8. Draw up and introduce to practice a strategy of informing the public of issues related to conservation of species diversity of forests and establish a platform for dealing with the issues of biodiversity conservation at the level of all involved sectors and main stakeholders from NGOs and forest owners.

## Related documents

Act No. 289/1995 Coll., on Forests, as amended

Act No. 149/2003 Coll., on the Conditions of Launching of the Reproductive Materials of Forest Materials of Forest Plants of Significantly Important Species, Hybrids which are designated for the Forest Restoration

Act No. 114/1992 Coll., on Protection of the Nature and the Landscape, as amended

Council Resolution: "On Forestry Strategy for the EU"

Regulation (EC) No 2152/2003 of the European Parliament and of the Council of 17 November 2003 concerning monitoring of forests and environmental interactions in the Community (Forest Focus)

Ministerial conference on protection of forests in Europe (MCPFE)

National Forest Programme - MoA, MoE

Basic Principles of state forestry policy - MoA

MoA 2003,2004: Report on the state of forests and forestry in the Czech Republic

Convention on Long-range Transboundary Air Pollution

CBD COP Decision V/4 - Progress report on the implementation of the programme of work on forest biodiversity

CBD COP Decision V/6 - Ecosystem approach

CBD COP Decision V/19 - National Reporting

CBD COP Decision VI/22 - Forest Biological Diversity


CBD COP Decision VII/1- Forest Biological Diversity

MA, 2003: National Forest Programme

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## I. Introduction

Communities of dry grasslands and also hygrophilic to wetland communities are the most important communities in grassland ecosystems that are currently independent or indirectly dependent on agricultural production. Both the above physiotypes are extraordinarily rich ecosystems, particularly in the species richness of vascular plants and invertebrates, mainly insects. The CBD programme of work on dry and sub-humid lands concentrates on arid, sub-humid areas, while the issue of steppe areas is dealt with only very marginally. Specific features and aspects of the Czech Republic could be found in submission of relevant information, case studies and public awareness. The specific objectives and steps are concerned with areas affected by permanent drought. Nevertheless, it should be pointed out that the overall topic is described and dealt with on the basis of the CBD programme of work. Protection of grassland ecosystems in the Czech Republic requires a special approach to agriculturally non-productive ecosystems, which are fundamental for maintaining unique biological communities and are particularly endangered by habitat transformation and land-use changes, the risk of introduction of non-indigenous species, changes in the burning and grazing regime, non-compliance with the principles of sustainable harvesting, and unsuitable soil and water management.



## II. Current Conditions

**Dry grasslands** are represented in the Czech Republic by **short-grass habitats** with dominant presence of narrow-leaved festucas and **broad-leaved grasslands** with higher grasses. **They are the one of the richest grass formations overall, with a concentration of a great many endangered plants.** Both the above formations occur mostly in the warm areas of Bohemia and Moravia. Communities of white slopes, which are named after the light arenaceous and marlite rocks, constitute a specific type of dry grasslands. They are mostly located on the southern edge of the České středohoří Hills and marginally also in the central Labe/ Elbe region and in Eastern Bohemia. Acidophilic dry grasslands that are bound to hedges, sunny slopes, field defects and similar habitats with occurrence of rare orchids and invertebrates are mainly fragmented and located at small sites.

A very positive step in supporting and maintaining the biodiversity of dry grasslands consisted in coming-back of sheep grazing in certain specially protected and unprotected areas, specifically supported by state subsidies since the late 1990s. These steps also include cutting of bushes or controlled burning of sunny slopes.

**Hygrophilic and wetland vegetation** is a mixture of several types of plant communities, including both the hygrophilic group of true meadow hygrophilic vegetation, and also sedge and reed communities. When extensively managed, these systems are characterized by very high biodiversity; when left fallow for a long period of time, individual dominant plants substantially reduce the original species diversity due to excessive production of old growth biomass. This state is very unfavourable for invertebrate fauna, which is dependent on diverse plant species as their source of nutrients. The greatest variety of grass hygrophilic and wetland growths is found in the basin areas and also in river floodplains and fishpond systems. Hygrophilic grass ecosystems are beginning to be restored as a result of the River System Restoration Programme and the Landscape Management Programme.

The **physiotype of mesophilic (true) meadows** contains both general types of vegetation and also **pre-intensive types**, which consist of a very diverse meadow community with **continuous extensive management** without fertilization (see the Agriculturally Managed Ecosystems chapter). These types have almost totally disappeared from the dominant cultural landscape and are preserved only under very specific conditions (e.g. in military training areas) and, in total, in a very small area. They are of considerable importance for science for understanding the ecology of balanced and stable ecosystems. These ecosystems are most extensive in the higher parts of mountains and are preserved mainly as pastures (cattle, sheep, horses) or by mowing or by a specific combination of management (traditional management, frequently created through a long tradition by the landowners).

The vegetation **growth in open to closed sand banks** is a rapidly disappearing type in the modern landscape, whose distribution is concentrated to areas of airborne sands around the Labe/ Elbe River and the Morava River and also in sandstone areas, where it grows in weathered sandstone. Derived types of this vegetation, with the form of interconnected grasslands, occur on the gravel-sand river terraces along rivers (e.g. the middle and lower Vltava, Labe /Elbe, upper Lužnice rivers).

Grassland ecosystems also include **salt marshes**, which are physiognomically similar to ruderal vegetation, without a predominance of grass species that, however, have no support in other sector areas. **Halophilic (salt-loving) vegetation** is the rarest physiotype of grass-herbaceous biome in the Czech Republic and occurs only at a few sites around subhalophilic fishponds and water courses in Central Bohemia and Southern Moravia. Some industrial sludge beds form a specific secondary habitat for halophilic vegetation, where its less diverse types can be found.

It has been possible to **maintain and support various vegetation types with diverse species** in the network of Specially Protected Areas; this is a great advantage both for research activities and also for the practically related restoration procedures in other degraded areas (sources of genetic material in restoring the original vegetation). Research projects and monitoring programmes can also be carried out on the subjects in the open landscape (not protected by a special regime) as a result of the development and support for ecosystems with diverse species (e.g. the River System Restoration Programme and the Landscape Management Programme). It has also been possible to carry out targeted research in the dynamics and functions of the individual ecosystems within R&D projects, announced by the Ministry of the Environment.

The habitat mapping of during the preparation of the Natura 2000 is an effective instrument for their identification. This mapping (2001 – 2004) permitted identification of valuable landscapes, which were proposed as sites of European importance and where optimal management is at the same time proposed, leading to conservation of varied grassland ecosystems (see the *In-Situ* Conservation chapter). Pursuant to the Article 6 of Act No. 114/1992 Coll., on the Protection of Nature and the Landscape, these ecosystems can be registered as important landscape features.



### III. Problem Issues

1. The ecosystems of semi-natural meadows, which are an important part of the agricultural landscape, were substantially disturbed by **general intensification of agricultural production**. In addition to direct factors, **compaction of the soil** by heavy machinery had a substantial impact on reducing the biodiversity, and is accompanied by disturbance of functioning healthy ecosystems and the disappearance of sensitive organisms.

The worst conditions were caused by drainage of the land and compaction of the soil. Consequently, the greatest damage was caused to varied hygrophilic meadows in river floodplains (see point 6) and the habitats of pre-intensive meadows, which are mostly situated in a valleys. The meadows that have been preserved to date are similarly endangered by **decisions of owners to change a grassland into pastures**, where animals are allowed to graze in uncontrolled numbers.

2. Steppe vegetation and vegetation on white slopes, which were formerly used as extensive pastures for sheep and goats and only rarely cattle because of their infertility, are now endangered most by the **decrease in farming management** (including local burning, see point 4). Abandoned grasslands are subject to the spreading of competitively successful plants and also neophytes (see point 3). Afforestation of these sites causes the most dangerous direct effect, leading to difficult-to-regulate ecosystem changes in the original vegetation. Afforestation can be seen as a conflict between the requirement on utilization of the productivity of these lands and protection of the gene pool of the original adapted vegetation.

3. Atmospheric levels of nitrogen pollutants, derived from car traffic and intensive agriculture, are an important factor, increasing the degradation of abandoned lands. These substances cause soil eutrophication and this supports for the spreading of competitively successful native plants, which substantially reduce the biodiversity through their aggressive growth and accumulation of litter.

4. The diverse steppe vegetation at some extreme sites was also maintained in the past by **fires**, spreading across the sunny slopes from sparks from steam engines. The accumulated old vegetation was thus exterminated, as tree species were invading. This specific effect also led to differentiation of the species composition of the influenced grasslands. Burning as control management should be used very carefully and only where another traditional management cannot be used and where, in its absence, there would be an irreversible loss of valuable habitats.

5. At attractive sites (e.g. viewpoints, etc.), dry grasslands are disturbed by **intensive tourism**. The vegetation is degraded by excessive trampling, frequent disturbance, and introduction of ruderal and/or invasive alien plants (see the Invasive Alien Species chapter).

6. All the hygrophilic and wetland habitats, including salt marsh vegetation, have been disturbed both by direct liquidation of the habitats in the spreading of large-scale agricultural production and also by destruction of the hydric regime of the habitat by drainage of the actual or neighbouring land. The greatest losses occurred in wetlands and wet meadows in river floodplains. This was mostly caused by **water management projects on river courses** that substantially or totally destroyed the natural hydric regime of the floodplains on which the particular habitats are fully dependent (see the Inland waters and Wetland Ecosystems chapter). The constant reduction and fragmentation of habitats also contributed to a reduction in the diversity of the vegetation. This led to a disturbance of exchange of migrating species, of the migration of pollinators and of the quality of the abiotic environment, and the ecosystems thus lost all the elements of the biota.

7. There are no legal procedures that would prevent the users of land from degrading it (erosion, compaction, loss of humus) and protect it adequately against excessive use of chemicals or other extensive contamination pollution.

8. The lack of sanctions, insufficient control (frequent conflicts of implemented interventions in the landscape with an incorrect interpretation of the Act No. 334/1992 Coll., on the protection of the agricultural land resources).



#### IV. Objectives

1. Maintenance of vegetation with a high plant diversity - important for the future stability and resilience of vegetation under the conditions of global climate change.

2. Preservation of the existing species rich vegetation to ensure the attractiveness of the landscape for tourism use and for recreation and leisure.
3. Stopping the spreading of expansive bushes to selected sites on white slopes.
4. Restoration of the hydric function of selected floodplains and drained depressions (essential condition for preventing degradation of ecosystem functions by drying out) and reduction of excessive supply to the soil of nutrients from former intensive fertilization in relation to restoration of wetlands and hygrophilic vegetation (see the Inland water and Wetland Ecosystems chapter).
5. Compliance with the regulation management prescribed in the plans for modified terrestrial and semi-terrestrial lands in projects within the River System Restoration Programme, consisting in mowing established meadows and occasional regeneration of wetland vegetation (e.g. by mowing in the winter or using harrows). Permanent management is necessary as protection of restored areas against spreading of expansive and/or invasive plants, where they are particularly vulnerable in the first few years.
6. Implementation of effective management interventions and permanent monitoring of the existing residual habitats for salt-marsh vegetation; in the next phase decontaminate this at ploughed sites around subhalophilic fishponds and water courses.
7. Concentration of scientific research primarily at Natura 2000 sites, permitting identification of the patterns governing the coexistence of flora and fauna in well-preserved ecosystems. Using targeted management of the vegetation, evaluation of the effectiveness of management procedures at selected sites. Continuous study on the effects of traditional management procedures methods and techniques as proposed optimal measures (see the *In-Situ* Conservation chapter).
8. In general, respecting and maximal maintenance of farming procedures and activities that have led to stabilization and subsequently the existence of the relevant components in the vegetation cover over the centuries. Emphasizing and monitoring compliance with the principles of sustainable harvesting of grass vegetation (i.e. select a frequency of mowing or pasturing or a combination of these so as to prevent excessive damage to and impoverishment of the vegetation). Preservation or recovery/restoration maintenance of abiotic conditions (especially the water regime for hygrophilic vegetation) for the conservation and permanent existence of diverse and balanced ecosystems.
9. In the framework of education of habitat managers raising awareness of the necessity of preserving grassland ecosystems and of the advantages of their existence for the development of the area, increasing the feeling of responsibility in public for the appearance and functioning of landscape structures.

## Related documents

Act No. 114/1992 Coll., on the Protection of Nature and Landscape, as amended

Act No. 334/1992 Coll., on the Protection of the Agricultural Land Resources

CBD COP Decision V/23 - Consideration of options for conservation and sustainable use of biological diversity in dryland, Mediterranean, arid, semi-arid, grassland and savannah ecosystems

CBD COP Decision VI/4 - Biological diversity of dry and sub-humid lands

CBD COP Decision VII/2 - Biological diversity of dry and sub-humid lands



### I. Introduction

Aquatic and wetland ecosystems serve as natural water reservoirs that are very vulnerable to changes in the hydrological regime and insensitive anthropogenic interventions. They cover a substantial part of the Earth's surface and have a number of unique functions. They stabilize the landscape and constitute key ecosystems for maintaining biodiversity, as they provide irreplaceable habitats for many fauna and flora species.

On the basis of the Convention on Wetlands of International Importance Especially as Waterfowl Habitats (the Ramsar Convention), aquatic and wetland ecosystems can be defined as areas characterized by the presence of static or flowing water, whether natural or artificial, water courses, reservoirs, lakes, fish ponds, pools, spring areas, peat bogs, and fens and raised bogs. Valley meadows adjacent to rivers and banks, which condition is determined to a substantial degree by the dynamics of surface waters and groundwater, must be considered to be an integral part of water ecosystems.

In the CBD's programme of work on inland water biological diversity, the emphasis is given to the integrated management of water ecosystems which would result in the use of valuable water sources on the basis of the sustainability principle and with the aim to conserve biodiversity. The basis for conservation of aquatic biodiversity lies in the ecosystem approach which includes monitoring and evaluation of biodiversity of water aquatic ecosystems, impact assessment, prevention of pressures in the framework of river basins and effective international cooperation in the area of management of water sources (see the Ecosystem Approach chapter).

### II. Current Conditions

Both in the Czech Republic and throughout Europe, aquatic and wetland habitats are the most affected and degraded type of ecosystems. Their biodiversity is endangered more than biodiversity of terrestrial ecosystems. Communities of aquatic and wetland ecosystems, phyto/zooplankton, phyto/zoobentos, macrophytocenoses and ichtyocenoses are rarely found in their natural species composition. A majority of vertebrates, amphibians, reptiles, water birds and mammals bound on water belong amongst endangered species. Of the total of 61 species of fish and cyclostomata, 19 species (31 %) were protected in the Czech Republic in 2003 pursuant to Act No. 114/1992 Coll., on Protection of Nature and the Landscape. Habitats that are closely bound on water include the vegetation of water courses and reservoirs, wetland and river bank vegetation and vegetation of spring areas and peat bogs, and, in relation to semi-aquatic ecosystems, vegetation of damp and flooded meadows, bank tree species and floodplain forests. Groundwater ecosystems provide habitats particularly for bacteriocenoses.

The territory of the Czech Republic creates the European watershed of three river systems of the Elbe, the Danube and the Odra river, and its water bearing is fully dependent on precipitation. Spring areas, dead and unused arms and alluvial waters are an integral part of river systems. Five glacial lakes are located in the Šumava Mountains. Only minor peat bog lakes are found in other mountain areas. Also given the presence of karst areas and territories with lack of water in the Czech Republic, specific aquatic habitats can be found, such as underground karst rivers, periodical surface rivers and other temporary aquatic habitats. There are only a negligible number of natural aquatic ecosystems with still water in the Czech Republic. Their functions from

the biodiversity point of view are replaced, to a certain degree, by fish-pond systems, which form an essential part of the Czech cultural landscape. The number of fish ponds currently exceeds 21 000. Artificial or highly modified ecosystems also include flooded quarries, sand pits and gravel pits, abandoned peat deposits, channels, mill races and amelioration ditches. Dam lakes are elements of discontinuity in river systems and constitute a special transitional body between still and flowing water, depending on the period of retention. The ecological state of water and wetland ecosystems is substantially determined by the character and condition of terrestrial ecosystems in their river basin.

Human activities, particularly in the recent decades, have markedly affected the state and functions of aquatic and wetland habitats (only approx. 1/4 has remained of the estimated total area of 1 300 thousands hectares of wetlands). The greatest impact was caused by extensive drainage of the landscape (over 1 mil. hectares of agriculturally utilized land has been extensively drained in the territory of the Czech Republic during the last 50 years) for the purposes of agriculture and forestry, intensive farming, physical modification of both the longitudinal and transverse profiles of water courses, their regulation and canalization, construction of transverse structures (discontinuities), discharging of municipal and industrial wastewater and atmospheric deposition.

The total length of water courses in the Czech Republic has been reduced through past modifications of the channels by at least one third. Regulation of water courses leads to a substantial loss of their environmental functions and to marked disturbance of the water regime of the landscape. Technical modifications of channels, including unsuitable flood-protection measures, still remain a fundamental problem in management of inland water ecosystems. Numerous structures on water courses cause obstacles preventing drifting and migration of aquatic organisms, which caused disappearance of, e.g., Atlantic salmon (*Salmo salar*) from the territory of the Czech Republic.

After 1989, the volumes of industrial and agricultural production substantially decreased and a number of wastewater treatment plants were built, resulting in fast and radical improvement of water quality. However, point and also diffuse pollution sources have not yet been fully eliminated and the effects of the eutrophication process are still marked. In spite of substantial reduction of emissions, the impact of acidification on biodiversity is still clear, particularly in oligotrophic mountain ecosystems.

Since the period of the greatest development of fish ponds at the beginning of modern times, the number of fish ponds in the territory of the Czech Republic has gradually decreased. The greatest reduction in their area occurred during the reign of Maria Theresia and Joseph II. (1740 – 1790) and also in the period since the 1950s when, due to insufficient care and increased erosion, a number of minor ponds have entirely vanished and the size of others has substantially decreased. Although a number of these artificial reservoirs were renewed after 1989, such minor water reservoirs that can increase biodiversity and improve water retention in the landscape are still lacking in a number of areas. In certain cases, the condition of fish ponds is unfavourably affected by eutrophication caused by pollution of water by municipal waste, and partly also by inflow of nutrients washed out from agricultural land.

Unsuitable interventions in the landscape have resulted in devaluation of aquatic and wetland habitats as important landscape features. The joint action of anthropogenic effects led to such damage of fresh-water ecosystems that ichtyocenoses have become the most endangered group in Europe. However, apart from the above, other communities of aquatic organisms are also substantially endangered. Certain species of aquatic fauna, such as the original species of crayfish stone crayfish (*Austropotamobius torrentium*) and freshwater crayfish (*Astacus astacus*) or freshwater pearl mussel (*Margaritifera margaritifera*) have already disappeared from a majority of original localities.

The Convention on Wetlands of International Importance especially as Waterfowl Habitats (the Ramsar Convention) obliges the member countries, including the Czech Republic, to delimit at least one internationally important wetland in its territory and to provide for its effective protection, as well as to provide for sound management of all wetlands. In total, 11 sites in the Czech Republic with an overall area of 47 212 ha (after further specification of the borders) have been registered as the Ramsar Sites in the List of Wetlands of International Importance under the Ramsar Convention. Wetlands of international importance that are endangered by changes of their ecological character are included in the *Montreux Record* – the list of endangered wetlands. Of Czech wetlands, two fish ponds in the Třeboň area (due to intensive management of the fish ponds) and in the Litovelské Pomoraví area (due to their endangering by construction of the Pomoraví water main that would unfavourably impact the valley-meadow ecosystems in the Ramsar locality) have been included in this list.

Water Framework Directive 2000/60/EC is a fundamental document stipulating the approach of the EU, as well as of the Czech Republic, as the EU Member State, to conservation of surface waters and groundwater. The method of implementation of this document is a matter of each Member State; however, the set environmental objectives are obligatory. The most important Czech legislation in the area of conservation of water biodiversity includes Act No. 254/2001 Coll., on Waters, and Act No. 102/1963 Coll., on Fisheries.



### III. Problem Issues

1. Unfavourable ecological condition of aquatic and wetland ecosystems caused by weakening of hydroecological functions of the landscape
  - Major exploitation of the landscape has led to extensive and spatial reduction of wetlands through amelioration, excessive withdrawals of surface and ground water lead to extensive drainage which, in turn, causes decrease in the level of groundwater and impairing of the water regime.
  - The landscape lacks riparian vegetation and bank trees and bushes.
  - The deficit of water in the landscape causes increased trophy of wetlands and acceleration of their transformation to terrestrial habitats.
  - Unsuitable management leads to soil degradation and drainage, and the more frequent occurrence of extensive and concentrated outflow on the surface causes increased erosion and subsequently silting of water bodies.
2. Inconsistent management of conservation of aquatic and wetland organisms
  - Spreading of invasive and geographically non-indigenous fauna and flora which suppress indigenous species.
  - Absence of natural predators, parasites and diseases leads to excessive multiplication of opportunistic species resulting in an unnatural structure of communities.
  - Massive tourism affects the natural dispersion and life cycles of aquatic organisms, the most important impact consists in disturbance of water birds during the nesting period.
  - Conservation of hydromorphological components of aquatic and wetland ecosystems is not adequately provided for in the legislation.
3. Pollution and change in the quality of physical and chemical components of aquatic ecosystems
  - Washing up of nutrients deposited in the past and intensive management connected with excessive use of artificial fertilizers and pesticides have resulted in pollution of the aquatic environment, which has

contributed to the eutrophication process.

- Unfinished process of construction of wastewater treatment plants.
- Hardly degradable, synthetic, toxic organic substances and heavy metals from the past are still present in the aquatic environment, even though their contents are gradually reduced, and, due to bio-accumulation in the tissues of aquatic organisms, they are involved in food chains.
- Recently, trace amounts of very specific substances, such as pharmaceuticals from wastewater discharged by health-care facilities and municipal wastewater, have been newly found in the aquatic environment.
- Substantial reduction of emissions (particularly of sulphur dioxide) has not resulted in any marked improvement in relation to acidification of aquatic ecosystems in mountain areas, which is also partly caused by extensive deforestation of the territory.

#### 4. Physical modifications and destruction of habitats of aquatic and wetland species of organisms

- Regulation, canalization, use of pipes and straightening of water courses and other technical interventions in aquatic and wetland ecosystems have resulted in destruction of natural habitats, particularly due to elimination of natural banks and water courses and reservoirs as biologically active zones for self-cleaning processes and various hydromorphological bodies as places for development of rare communities.
- Straightening of water courses in the past led to substantial reduction of the length of the water network in the Czech Republic, approximately by one third, faster outflow of water from the landscape, spatial reduction of channels, pools and arms, and destruction of meanders.
- Unsuitable manipulation of the flow rates by means of a set of hydro-regulatory water works, withdrawal and discharge of water, and also canalization and variations in the water levels in water reservoirs have an unfavourable impact on the degree of biodiversity of aquatic organisms.
- Construction of water works has led to interrupting of the continuity of water courses by barrages and dykes, the regime of suspended solids has been modified, the physical and chemical characteristics have been changed, and genetic exchange, active and passive drifting, migration and natural dispersion of aquatic organisms has been prevented.



## IV. Objectives

### 1. Improvement of the unfavourable ecological condition of aquatic and wetland ecosystem and the hydroecological functions of the landscape

- Provide for sustainable use of water resources in the context of economic pressures and global changes.
- Ensure revitalization leading to transformation of aquatic and wetland ecosystems to a state close to the nature.
- Improve the retention function of the landscape by diversification of the manners of use of the landscape and landscape features and by removing amelioration measures in parts of the landscape that are unsuitable for farming.
- Refrain from preventing natural processes resulting in spontaneous renewal of aquatic and wetland ecosystems.
- Enforce effective anti-flood measures in the cultural landscape with the use of natural hydroecological functions.

### 2. Conservation and management of aquatic and wetland ecosystems

- Implement extensive conservation measures and maintain the current nature-like water and wetland ecosystems in the Czech Republic and halt their destruction.

- Provide for intersectoral coordination of management of aquatic and wetland ecosystems.
  - Continue implementation of recovery programmes and operation of nursery facilities for endangered species of aquatic fauna and flora and their subsequent reintroduction to open nature.
  - Prevent further spreading of invasive alien species and geographically non-indigenous organisms and adopt measures to limit the current populations of these species.
  - In accordance with Water Framework Directive 2000/60/EC, create a national, integrated and comprehensive monitoring system, including monitoring of hydromorphological and biological components of surface waters.
3. Limitation of pollution and improvement of the quality of physical and chemical components of aquatic and wetland ecosystems
- Finalize the system of effective treatment of wastewater in the territory of the Czech Republic.
  - On a country-wide scale, reduce the use of fertilizers and pesticides and, thus, support the reduction of intensity of pollution of the aquatic environment from diffuse sources.
  - Reduce the risks of pollution of groundwater and surface waters from old environmental burdens and ecological accidents.
  - Strictly comply with the set emission limit values.
4. Diversification of hydromorphological components of aquatic and wetland ecosystems
- In places where regulation is not essential, remove regulation and renew the original state of river channels with the use of cheap technologies.
  - Maintain varied hydromorphological formations in aquatic ecosystems, allow their occurrence and existence, and provide for their conservation.
  - Renew the continuity of the river network by removing unused and non-functional water works and provide for passage of fish through functional and necessary structures by means of fish ladders.
  - Where feasible, enable contact of surface and ground water and contact between the aquatic and terrestrial environment by interconnecting valley meadows with water courses, and enable all natural processes related to regular flooding.
  - Stipulate ecologically acceptable values for the range of variance for the purposes of manipulation of flow rates through water works.
5. Limitation of unfavourable impact of agriculture and fishing on aquatic and wetland ecosystems
- Ensure sustainable farming in the landscape, with respect to the principles of good agricultural practice and with support for development of organic farming.
  - Introduce a system of measures preventing eutrophication, erosion and excessive transport of sediments in the cultural landscape.
  - Provide for fish breeding under sustainable environmental and economic management conditions.
  - In open waters, respect the interests of aquatic communities and economically unimportant species of aquatic organisms in the framework of selective fishing and introduction of economically important species of fish.

## Related documents

Act. No. 114/1992 Coll., on Protection of Nature and the Landscape

Act No. 254/2001 Coll., on Waters

Act No. 99/2004 Coll., on Fisheries as amended

Government Order No. 61/2003 Coll., on indicators and values of permissible pollution of surface waters and waste waters, on necessities of permissions for discharge of waste waters into the surface waters and into the drainage and about sensitive areas

Government Order No. 71/2003 Coll., on determination of surface waters suitable for live and reproduction of indigenous fish species and other water animals and about the assessment of the water quality

Government Order No. 103/2003 Coll., on the determination of vulnerable areas and on use and fertilizers and manure disposal, crop rotation, and on land erosion control in these areas

Council Directive 79/409/EC - on the conservation of the wild birds

Council Directive 92/43/EC - on the conservation of natural habitats and of wild fauna and flora

Water Framework Directive 2000/60/ES

The Freshwater Fish Directive - Council Directive on the quality of fresh waters needing protection or improvement in order to support fish life (78/659/EC) as transposed into Irish law under the E.C. (Quality of Salmonid Waters) Regulations 1988 (S.I. No. 293 of 1988).

Council Directive 91/676/EC on Protection of waters against pollution caused by Nitrates from Agricultural Sources (Nitrate-vulnerable Zones)

Council Directive 91/271/EC on Urban waste water treatment

Pan-European Biological and Landscape Diversity

Ramsar Convention – Convention on Wetlands of International Importance especially as Waterfowl Habitat

Convention on the Protection and Use of Transboundary Watercourses and International Lakes

Convention on the International Commission for the Elbe River Protection

Convention on cooperation for the Protection and Sustainable Use of the Danube River

Convention on the International Commission for the Oder River Protection against Pollution

River basin restoration programme

Landscape protection Programme

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CBD COP Decision IV/4 - Status and trends of the biological diversity of inland water ecosystems and options for conservation and sustainable use

CBD COP Decision VI/2 - Biological diversity of inland waters

CBD COP Decision VII/4 - Biological diversity of inland waters



## I. Introduction

Mountain areas are an important source of water, energy and biodiversity, a source of key wealth, such as e.g. mineral resources, forest and agricultural products and recreational opportunities.

Mountain ecosystems are unique, not only as such, but also as ecosystems where various and also interconnected forest, aquatic and grassland communities and their habitats can be found. Furthermore, the variety of wildlife species is based on the isolation of individual mountain systems which leads to high level of endemism. Moreover, mountains have become a refuge for various species that had previously lost favourable living conditions due to habitat degradation and loss.

Mountain ecosystems are endangered by accelerated soil erosion, landslides and rapid loss of the wildlife natural habitats and genetic diversity. The decline of traditional knowledge of the population in mountain areas leads to the environmental degradation in most of mountain areas. Therefore, proper management of natural resources and socio-economic development of mountain areas requires immediate intervention and measures.<sup>7</sup> This requirement is also mentioned in the document entitled International Partnership for Sustainable Development in Mountain Regions adopted at the World Summit on Sustainable Development in Johannesburg in 2002. Approximately 10 % of the world population is directly dependent on the resources located in mountain areas; however, a much larger proportion of population uses or visits mountain areas.



## II. Current Conditions

Mountain areas in the Czech Republic are located particularly in the border regions of Bohemia, Moravia and Silesia. The unique natural, as well as historical and environmental factors in the Czech mountains are caused by biogeographical and geopolitical location at the fringe of old Hercynian and young West-Carpathian mountains, in the neighbourhood of the Alps and also with an opening to the Hungarian lowlands. The highest mountain system of the Czech Republic is the Krkonoše Mountains (the Giant Mountains) with the highest peak of the Sněžka at 1,602 m a.s.l. Mountain systems with at least one peak exceeding the level of 1,000 m a.s.l. (there are 582 such peaks) cover an area of 10 thousands km<sup>2</sup> which corresponds to 12.7 % of the whole area of the Czech Republic.

Mountain areas of the Czech Republic are divided to four vegetative elevation zones (sub-mountain, mountain, sub-alpine and alpine); however, a natural forest-free territory above the forest line (the sub-alpine zone) has been developed only in three mountain systems (Krkonoše, Hrubý Jeseník, Králický Sněžník).

Undoubtedly, the complex system of Alpine and Nordic ecosystems above the forest line in Krkonoše, the arctic-alpine tundra, is the most important system from the viewpoint of biodiversity of the Czech Republic. Important and the most endangered ecosystems in mountain areas of the Czech Republic include particularly the ecosystems of sub-alpine spring areas, transitional peat bogs and raised bogs or the ecosystems of glacier


lakes.<sup>8</sup> Forest ecosystems and, due to their ecological, economic and recreational functions, the communities of important mountain meadows are also important from the viewpoint of ecological, hydrological and stabilization functions.

From the socio-economic point of view, mountain areas are also marginal regions with all the consequences of this fact. Almost 60 to 70 % of mountain areas have the status of a Specially Protected Area in the Czech Republic (see the *In Situ* Conservation chapter).



### III. Problem Issues

1. Introduction of non-native species of flora and fauna to the natural and semi-natural mountain ecosystems (e.g. during reclamation, by means of transport or as a consequence of tourism) (see the Invasive Alien Species chapter).
2. Unsuitable reclaiming and repairation of paths and other sites with the use of allochthonous geological materials (soil eutrophication and consequent changes in plant communities and the related animal species).
3. Eutrophication and contamination of both the terrestrial and aquatic habitats due to input of allochthonous substances from point, linear and area pollution sources (see the Inland Water and Wetland Ecosystems chapter).
4. Lack of management, as well as excessively intensive farming supporting the penetration invasive and expansive plant species and rapid species degradation of grassland communities.
5. Reduced species composition and impaired health condition of forests.
6. High number of ungulate game (danger to valuable wetland ecosystems, excessive disturbance of vegetation on avalanche slopes in glacier cirques, unreasonable damage to forest vegetation, disturbance of certain animals, etc.) (see the Forest Ecosystems chapter).
7. Intensive tourism (construction of resorts for Alpine and Nordic skiing, construction of excessively large recreational facilities, building infrastructure significantly reducing natural habitats, increased noise and light pollution (disturbance of animals), increased trampling, all aspects of new sports activities (skialpinism, snowmobiles, paragliding, mountain bicycles, etc.) and growing traffic intensity) (see the Transport, Tourism chapters).
8. Interventions in hydrological conditions (drainage, rills caused by unsuitable skidding, water course canalization, deep drainage or, in contrast, water-logging at certain sites, artificial snow on ski slopes) which can contribute to accelerated runoff and to the occurrence of floods (see the Inland Water and Wetland Ecosystems chapter).
9. Decline and destruction of the traditional ways of life of the local population and economic activities in mountain ecosystems, related to a change in socio-economic and cultural patterns (decline of the traditional ways of life and depopulation of mountain areas, settlement of urban population primarily on commercial basis).



### IV. Objectives

1. Reduce the unfavourable phenomena as the main threats for mountain biodiversity; conserve and, where possible, restore the original mountain biodiversity; support sustainable use of natural resources or maintaining genetic diversity in mountain areas in particular through the preservation and maintenance of traditional knowledge and practices (Decision VII/27).

<sup>8</sup> A number of these localities are protected by the Ramsar Convention.



2. Monitor the development of biodiversity in mountain ecosystems (Decision VII/8), with emphasis on the global climate change (Decision VII/15), on their health condition, on population dynamics of native plants and animals, on increasing the sizes of selected wildlife populations and on invasive species. Pay increased attention to research and management for all endemic and biogeographically important populations (see the Monitoring and Indicators chapter).
3. Preferentially use geographically indigenous populations as source populations for further use in afforestation and reclaiming with the use of suitable, particularly biological, amelioration aimed at modifying the soil chemistry.
4. Manage in a sustainable way non-forest – semi-cultural and cultural – ecosystems (by mowing, grazing) (Decision VII/27) depending on the management needs of the individual populations and communities (see the Grassland Ecosystems chapter).
5. Eliminate excessive introduction of xenobiotic substances causing unnatural acidification and eutrophication from global, regional and local pollution sources (see the Climate Change chapter). Prevent excessive introduction of chemical substances in forestry and agricultural amelioration (fertilization and liming).
6. Prevent afforestation of naturally forest-free areas of the arctic-alpine tundra (e.g. cirques, spring areas, sites with occurrence of important periglacial formations), encourage gradual increase in the proportion of indigenous species in the individual habitats.
7. Concentrate management on changes in the species composition and spatial structure of forests aimed at the natural state of affairs, and prefer semi-natural measures of forest management: avoid removing hollow and all dead trees, prefer small-scale and undergrowth management. In forest ecosystem management, use sound technologies with the aim to minimize unfavourable impact on the natural habitats (Decision VI/22).
8. Direct and control tourism, sports activities (tourist paths, newly established sports resorts, mountain climbing, auxiliary infrastructure) and transport to less sensitive (vulnerable) and less important areas from the viewpoint of nature conservation in accordance with the Principles of Sustainable Tourism in Vulnerable Ecosystems (see the Tourism chapter) (Decision VII/14). In areas inhabited by animal species sensitive to stress factors, establish quiet zones with limitations for entry of tourists and limitation of other effects.
9. Reduce damages to the mountain landscape character / scenery by construction of vertical structures (e.g. towers of mobile operators, transmitters, wind farms, flood-light towers, including the effects of light pollution).
10. Consistently direct all developments in mountain areas by drawing up land-use and territorial documentation which corresponds to the principles of sustainable development and the carrying capacity of the environment (see the Regional Planning chapter).
11. Encourage crossborder cooperation in biodiversity conservation of border mountain systems (Agenda 21).

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CBD COP Decision VII/27 - Mountain Biological diversity



## I. Introduction

Regional policies are concerned particularly with harmonizing and balancing development of individual regions, reducing differences between the levels of their development and activating the potential for development of the regions. Their strategic environmental goals include development of multifunctional agriculture, support for non-productive functions of forests, improvement of the overall state of the environment in the regions and integration of environmental viewpoints in decision-making of sectors with substantial environmental impact. The basic instruments of regional policies include extensive and regional assistance programmes. Land-use planning is an important conceptual instrument of regional policies.

Land-use planning is concerned with spatial and temporal coordination of all specific plans for land use (both public and private) and protection of values of the land, including the healthy environment. The objective of land-use planning is to ensure harmonic land use, establishing spatial conditions for appropriate development, and, with respect to future generations, to ensure that natural resources are not used above the appropriate level, that the environment is not damaged, and that biodiversity, the restoration capacity of nature and the cultural wealth are not reduced. The instruments of land-use planning include basic land-use planning documents (e.g., urban development studies), land-use planning documentation (land-use plan of a major territorial unit, land-use plan of a municipality, plan of regulation) and the mechanism of land-use decision-making.

On the basis of the Constitutional Act No. 347/1997 Coll., on Establishment of Higher Territorial Self-governing Units, the Czech Republic is divided into 14 regions. The regions correspond to NUTS 3 statistical units. Compared to average the EU NUTS 2, i.e. units that are supported through subsidies from the EU Structural Funds, the regions have 2.5 times less population and 4 times smaller area. Therefore, in order to ensure comparability of data for the areas in the Czech Republic with the areas of the same level in the EU, it was necessary to establish associated regions, i.e. areas at the NUTS 2 level. The number of inhabitants in such 8 territorial units exceeds 1 million. The NUTS classification (*La Nomenclature des Unités Territoriales Statistiques*) is used for statistical monitoring and analyses of the socio-economic situation in regions and for the needs of preparation, implementation and evaluation of regional policies.



## II. Current Conditions

There are currently substantial differences in regional developmental trends in biodiversity and economy in the Czech Republic. The inter-regional economic variances are very high between Prague, on the one hand, and the remaining regions of the country, on the other. The variances between other regions, except for Prague, are not that considerable. However, the differences are again greater at a sub-regional level, both in the framework of the administrative regions and districts. From the viewpoint of economic development, there is a certain West-East axis, where Eastern and North-Eastern areas of the country are less developed than Western areas on a hypothetical line crossing Karlovy Vary (Carlsbad), Prague, Brno and Zlín. The developmental trends in the state of biodiversity are almost opposite to the economic tendencies. A major part of Specially Protected Areas and agricultural areas are located in economically marginal regions. This is also related to different environmental issues in prosperous areas and in economically marginal regions. The basic instruments for influencing

biodiversity include the land-use plans and subsidy programmes in the framework of operational programmes and the Cohesion Fund. Implementation of all projects co-financed from the Structural Funds and the Cohesion Fund in accordance with the Birds and Habitats Directives is conditional on the fact that the rare natural habitats covered by the Natura 2000 network will not be directly or indirectly affected by these projects.

Due to the various subsidies, lack of land management in marginal areas is no longer an issue. However, the low diversity of economic and farming activities pursued in the predominant medium-sized farms remains to be a problem.

The pressure for using agricultural land for construction is increasing in the centres of economic growth. The developmental trends also include economic marginalization of certain areas with heavily damaged environment (this concerns particularly areas affected by coal mining).

Biodiversity can be influenced in land-use plans particularly by means of regulative documents which stipulate the permissible, conditionally permissible and impermissible manners of use of each individual area. The regulative documents respect all limits for land use, such as Specially Protected Areas, important landscape features, territorial systems of ecological stability (TSES), natural parks, memorial trees and tree species growing outside forests, as well as forest land.

**Territorial systems of ecological stability (TSES)** which are important instruments to ensure the necessary conditions for conservation of and increase in biodiversity are defined, modified and further specified within preparation of the land-use planning documentation. TSES are defined at three interconnected levels - **supraregional, regional and local**. Supraregional TSES are part of the Pan-European Ecological Network (PEEN) being under preparation. At the present time, the land-use documentation covers, by means of land-use plans of major territorial units, a majority of the territory of the Czech Republic. This is unlike the land-use plans of municipalities. It can be stated in this respect that the smaller the municipality, the less frequent is a relevant land-use plan or a discussed urban development study.

Certain changes in the approach to landscape management have been brought by the **European Landscape Convention**. The Convention is an important international legal instrument intended for conservation, management and planning of all landscape types in Europe. It encourages European countries to provide for landscape management and planning in their legislation. The Convention applies to all landscape types, from primary to totally damaged. Each country which has become a Contracting Party to the Convention should carry out inventory and evaluation of the landscape in its territory from the viewpoint of its rarity, extent and specific values. The Czech Republic should build the necessary capacity for fulfilment of the commitments following from the European Landscape Convention.


In addition to nation-wide instruments, certain instruments of regional development are concentrated in specific regions. Continuity of crossborder nature conservation (e.g. in national parks – Krkonoše / Giant Mountains, Šumava / Bohemian Forest, Podyjí / Thaya River Basin, České Švýcarsko / Bohemian Switzerland), as well as the Euro-regions, which can specifically, without respect to state frontiers, encourage activities improving the environment, is particularly important from the viewpoint of biodiversity conservation. At the present time, the territory of the Czech Republic encompasses a total of 13 such regions.

### III. Problem Issues

1. Absence or out-of-date of the land-use planning documentation in a number of small municipalities.
2. Low diversity of farming and auxiliary economic activities in marginal rural areas.
3. Extensive use of agricultural land for construction in suburbs of large agglomerations without respect to the long-term development of this landscape, its environmental stabilization, aesthetic and recreational functions. These aspects are usually dealt with by land-use planning documentation changes. Frequent changes in the land-use planning documentation result in loss of its conceptual and policy character.
4. Inadequate mechanisms for conservation and restoration of the composing elements of TSES at all its levels. The slow rate of land consolidation / replotting reducing the potential for implementation of TSES.
5. Lack of uniformity in drawing up basic land-use planning documents for the general specifications of local TSES which hinders their use in the land-use planning documentation. Low accessibility of these general specifications.
6. Collisions with TSES elements occur in planning and implementation of linear structures, without ensuring the corresponding technical solution of this collision in all cases.
7. Land-use planning does not deal with land use based on determination of ecological carrying capacity of the landscape for the given types of economic activities.
8. Use of non-built-up areas is sometimes dealt with formally within the land-use documentation. Different emphasis is placed on non-built-up and built-up territories.
9. More in-depth approach to landscape planning is lacking. The European Landscape Convention has been not yet fully respected under the legal, administrative and economic conditions in the Czech Republic.


### IV. Objectives

1. Encourage the preparation of strategic developmental documentation at all levels.
2. Strengthen instruments for promotion of sustainable development of rural areas; use instruments that have a favourable impact on the environment.
3. Encourage environmentally sound means of tourism.
4. Support and protect the landscape character / scenery of the territory and its features, such as isolated trees, green strips along highways and roads, sources of drinking water, wetlands and minor water reservoirs and water courses.
5. Strengthen instruments promoting the re-use of brownfields.
6. Protect natural landscape features in built-up areas.
7. Accelerate implementation of land consolidation / replotting.
8. Implement the missing spatial elements of TSES.
9. Limit habitat fragmentation caused by migration barriers.
10. Integrate new methods on evaluation of the carrying capacity and vulnerability of the landscape and protection of landscape values in land-use planning.
11. Fully implement the commitments raising for the Czech Republic as a Contracting Party to the European Landscape Convention.



## I. Introduction

Transport is one of the most rapidly developing sectors of economy. The growth of transport volumes and the development of transport infrastructure are becoming the main factors endangering biodiversity. Construction of the transport infrastructure results in loss of natural habitats, its existence has unfavourable impact on the natural migration of animals; traffic on transport routes causes direct losses of animals and contributes to pollution of the environment. Existence of infrastructure in the landscape, in connection with traffic on this infrastructure, causes the landscape fragmentation. Several conceptual and strategic documents are concerned with the issues of further development of transport in the Czech Republic, including the Transport Policy of the Czech Republic, the Proposal for Development of Transport Networks in the Czech Republic until 2010 and others which are currently being prepared. The issue of impact of transport on the environment is also dealt with by the main state documents in the area of environmental protection, e.g. the State Environmental Policy, the State Nature Conservation and Landscape Protection Programme of the Czech Republic, etc.



## II. Current Conditions

The total density of transport networks and the total transport volumes in the Czech Republic currently correspond to the average for the countries of Western Europe. The density of highways in the Czech Republic is comparable to other EU countries; however, a majority of highways, except for the most important routes, are in poor technical condition and the regional highway infrastructure has been neglected from the viewpoint of technical development and maintenance, which unfavourably affects both the environment and traffic safety. The density of motorways and high-speed highways is substantially lower than in a majority of countries of Western Europe; their current length in the Czech Republic equals approx. 50 % of the target state (see Government Resolution No. 631/1993).

The impact on biodiversity was not adequately dealt with in relation to a majority of structures built in the past (particularly the barrier effect and the consequent fragmentation of the environment); however, the situation has substantially improved in the recent years.

The regional and local railway networks are very dense compared to the neighbouring countries; however, due to the long neglected maintenance, they are obsolete and their use is limited compared to the environmentally desirable ratio of transport volumes. Four railway transit corridors, two of which have already been modernized, are contemplated in the framework of modernization of the railway network. The main risk connected with this plan from the viewpoint of biodiversity again lies in the substantial barrier effect increasing fragmentation of the environment. Extension of the network of motorways and high-speed highways and modernization of other transport routes must be expected in coming years with respect to the transport infrastructure. This could cause marked unfavourable impact on biodiversity, but also provide an opportunity to minimize the unfavourable impact of transport on the basis of a suitable solution.

Nine public airports with an international license and 59 national public airports intended particularly for public passenger transport are used for the purposes of civil air transport. As air transport has been the most progressive

sector of passenger transport in the last decade, modernization of the main airports including their extension, where appropriate, must be expected.

Inland water transport is operated on the Elbe-Vltava waterway. No substantial increase in the scope of navigable reaches is likely given the expected volumes and importance of water transport. Further potential for development of inland water transport must be sought particularly in modernization and increased effectiveness.



### III. Problem Issues

The threats posed by transport in relation to biodiversity can be divided into three groups:

#### a) Effect of infrastructure development:

1. **Direct loss of natural habitats due to use of properties.** Transport infrastructure covers a substantial part of the Czech Republic. Given the required parameters, a number of structures cannot be implemented without permanent or temporary use of natural habitats including habitats of specially protected and endangered species. Construction of the transport infrastructure may involve temporary damage to habitats in the framework of the construction procedure.
2. **Spreading of geographically non-indigenous species along transport routes.** This includes particularly planting and sowing of non-indigenous species along transport routes. Non-indigenous species of flora and fauna can behave invasively, with a detrimental impact on the original communities.

#### b) Effects of traffic:

1. **Killing animals by traffic.** With respect to certain groups of animals, direct losses caused by traffic could limit the survival of the species in the given area.
2. **Indirect consequences – changes in adjacent habitats caused by pollution and disturbance.** Transport is an important source of emissions, including nitrogen oxides. Increased deposition of nitrogen endangers, on a nation-wide scale, particularly communities in habitats with low nutritional values where it causes substantial changes in the species composition. Disturbance by transport could cause disappearance of sensitive species of animals in the vicinity of transport routes.
3. **Involuntary introduction of geographically non-indigenous species along transport routes.** Non-indigenous species of flora and fauna can behave invasively, with a detrimental impact on the original communities.

#### c) Effect of existence of infrastructure in relation to traffic thereon:

1. **Fragmentation of the environment and populations.** Division of the originally non-fragmented landscape by insurmountable barriers (e.g. fenced transport routes) results in establishment of small isolated populations which are not capable of independent survival in the long term. Fragmentation of the environment by transport infrastructure is currently considered to be a factor limiting survival of a number of species of fauna.
2. **Disturbance of animals by traffic and particularly by noise.** These effects could have impact on animal communities resulting in their migration to unaffected localities.



## IV. Objectives

1. Stipulate appropriate approaches to transport development and distribution of transport activities in favour of sound means of transport and with respect to the carrying capacity of the territory according to the principles of sustainable development.
2. Maximally protect natural territories in proposing new transport structures and, by available means, avoid excessive fragmentation of the environment and killing of animals by traffic. Build crossings and corridors for movement of animals across transport routes.
3. By available measures, limit involuntary introduction of non-indigenous species along transport routes. (SNCLPP CR)
4. Systematically limit the unfavourable impact of transport on the environment and limit the disturbing effects of traffic.
5. Build structures used for navigation on water courses only if these structures will not cause occurrence of migration barriers, endangering or destruction of natural habitats and habitats of protected and endangered species. Gradually implement the action plan of construction of fish ladders on navigable reaches of water courses.
6. Encourage environmentally sound means of transport, including further development of suitably situated cyclist routes. (SEP)
7. Gradually supplement facilities for crossing the current transport routes by wild fauna.


### Related documents

Czech Republic Transport Policy, 2005

Draft of the Transport Network Development in the Czech Republic up to 2010


Regional Development Strategy of the Czech Republic





## I. Introduction

Unfavourable impact on the environment and, thus, also on biodiversity in Europe was reduced thanks to energy transformation measures adopted during the 1990s. While measures to increase energy efficiency and increased use of renewable sources of energy continue to facilitate certain reduction of the environmental impact, nevertheless, substantially more intensive efforts will be required, particularly with respect to emissions of gases contributing to the climate change. Emissions from energy production contribute to changes resulting in the climate change. This unfavourable effect is caused particularly by emissions of carbon dioxide and other harmful substances. However, the potential impact of the climate change on biodiversity is still the subject of disputes and scenarios which are constantly changing with the progress of scientific knowledge. Total emissions of greenhouse gases in Europe decreased in the 1990-1999 period, particularly due to economic difficulties and restructuring processes in the countries of Central and Eastern Europe. According to EEA estimates (Environment in Europe, third round of evaluation, 2003), it is likely that these emissions will again rise with improvement of economies of the individual countries. In addition to indirect impact on biodiversity caused by emissions and pollution levels, and ionizing and non-ionizing radiation from power plants, energy production has also direct impact on biodiversity. Facilities using renewable energy sources must also be designed and operated with respect to nature conservation.



## II. Current Conditions

*Energy production in the Czech Republic causes 42 % of CO<sub>2</sub> emissions, where ten most important power plants and heating plants burning fossil fuels are responsible for a vast majority of emissions of pollutants.* In summary, it can be stated that, from 1990 to 1999, in spite of certain individual fluctuations, these emissions decreased by 26.6 % compared to 1990. In 2000 and 2001 the emissions increased by 4.3 % compared to 1999. This increase was caused mainly by the fact that, as a consequence of growing exports of electricity and prices of natural gas, the consumption of solid fossil fuels increased in the production of electricity and particularly heat.

The energy system is based on use of fossil and nuclear fuels; the structure of consumption of primary energy sources is highly unfavourable from the environmental viewpoint. The share of solid fossil fuels in this consumption equals 53 %. This corresponds to the high emissions of harmful substances and the related environmental pollution and endangering of biodiversity.

Renewable energy sources (RES) contribute by approx. 2.6 % to the consumption of primary energy sources and by approx. 3.4 % to electricity production. RES are used particularly in the production of heat (75 %), where biomass is the main source. Energy production in water power plants (97 %) is predominant in the structure of production of electricity from RES, where two thirds of this amount is produced by major water power plants. 3 % are covered by wind and photovoltaic power plants.

A substantial share in the reduction of emissions achieved to date corresponds to the overall decrease in the performance of the economy in the period at the beginning of the transformation process from 1990 to 1993, rather than to introduction of modern energy-saving technology and facilities.

Linear energy structures can directly unfavourably affect animals. Therefore, Act No. 114/1992 Coll., on Protection of Nature and the Landscape, as amended, stipulates the conditions for every person who builds or rebuilds above-ground high-voltage lines; above-ground lines must be equipped with protective means that effectively prevent electrocution of birds.

Energy production in wide sense also includes mining of raw materials with substantial impact on the landscape, including irreversible changes in the landscape. Orientation of energy production on use of domestic deposits of brown coal and uranium caused problems related to remediation of the consequences of coal mining, mining of uranium ores and their processing. Vast abandoned areas are created where plans must be prepared for their renewed integration in the landscape (see the Unreclaimed Areas chapter).

The geographic position and natural conditions of the Czech Republic are not optimal for highly predominant use of any specific renewable energy source. Therefore, it is necessary, depending on the local conditions, to use both wind and water power plants, and also solar and biomass plants.

The share of renewable energy sources in consumption of primary energy sources is low (2.6 %). In the Accession Agreement to the EU, the Czech Republic agreed to increase this share to 6 % in 2010 and to increase the share of electricity from RES in consumption to 8 % in the same year. However, in an attempt to increase the share of renewable energy sources, the potential unfavourable impact of use of these sources on biodiversity at all three levels is neglected in certain cases. Indeed, an imprudent approach could lead to degradation of habitats, to their fragmentation resulting in isolation of population and to loss of ecological functions of the landscape. In some cases, wind power plants are designed without any respect to the landscape character, migration routes of birds or their nesting places.

Since 1990, Czech companies have implemented a number of expensive measures to reduce air pollution. Some of the projects of modernization of Czech power and heating plants (desulphurisation, denitrification) were implemented with foreign investment and technical assistance.

In spite of undoubted success of the Czech Republic with respect to fulfilling the obligations to reduce greenhouse gases pursuant to the Kyoto Protocol (Kyoto, 1997), although this success was achieved in a passive manner, it is true that, after accession to the EU, the Czech Republic is a country whose production of greenhouse gases per capita or per unit of the gross domestic product (GDP) is among the highest in the enlarged EU. It follows from this fact that there is a realistic concern that the Czech Republic could miss its opportunity to initiate favourable trends of reduction of emissions of greenhouse gases from energy-production processes and could face serious difficulties in fulfilment of new commitments. The priorities of the EU energy policy include safety, energy efficiency and use of renewable sources.



### III. Problem Issues

1. The efforts to reduce of greenhouse gases emissions have not been initiated in the Czech Republic. Therefore, it is likely that these emissions will grow at a rate corresponding to the growth of GDP. The Czech economy consumes 1.7 times more energy per unit of GDP than EU countries. Thus, the environment is burdened by emissions more than necessary with respect to the state of the art. Externalities related to the use of fossil and nuclear fuels are not internalized. Thus, renewable energy sources are artificially disfavoured.


2. The effects of wind power plants on biodiversity include exclusively impact on birds. Direct injuries to birds can be estimated in a manner similar to above-ground power lines or towers of transmitters. The disturbance caused by wind power plants is much more substantial - certain species of birds avoid these power plants by up to 500 meters. Species that are more sensitive to anthropogenic changes in the environment react negatively in this respect. Migration of birds is affected by this phenomenon. The increasing sizes of wind power plants result in greater effects on birds.
3. Water power plants constitute a barrier for migration of fish and invertebrates. Problems also occur in providing for minimum flow rates in water courses and the level of groundwater could also be affected.
4. Cultivation of energy-production plants is incompatible with nature conservation only in some specially protected areas or parts thereof. However, there are risks related to the newly introduced species of plants intended for technical purposes from the viewpoint of their potential spreading which is difficult to control. There is also a risk of using protective chemical preparations and fertilizers for the purpose of high production of biomass from the viewpoint of water pollution, etc.
5. Unsuitable design of towers of high-voltage power lines causes numerous deaths, particularly of raptors. Given their number, high-voltage power lines are one of substantial factors contributing to reduction of the number of these species, even though construction of new lines is now subject to rules respecting protection of birds.
6. Uncoordinated permitting of construction of minor water power plants. Their construction at variance with the approved documentation and incorrect handling of water cause serious damage to a number of important reaches of water courses, consisting particularly in the creation of barriers on water courses insurmountable for aquatic organisms and drying of channels of the main water courses during dry periods of year which, in turn, results in extinction of a number of organisms in the affected reaches of water courses.



#### IV. Objectives

1. Reduce emissions of greenhouse gases affecting all components of nature.
2. Increase the share of renewable energy sources in energy consumption with the use of the best available technology accompanied by an increase in reliability and safety of supplies in decentralized energy-supply systems with simultaneous elimination of the unfavourable impact on nature and the landscape and with respect to economic criteria.
4. Support implementation of measures in the framework of the National Programme to Abate the Climate Change Impact in the CR (see the Climate Change chapter).
5. Direct the construction of facilities utilizing renewable energy sources and specify areas suitable for construction of wind power plants. From amongst these localities, exclude specially protected areas (PLAs, national parks, small SPAs), wetlands of international importance and Natura 2000 sites, and localities involving migration routes of birds and bats or regionally important habitats for specially protected species of flora and fauna. Specify water courses where construction of minor water power plants does not involve a fundamental intervention in the ecosystem and, in places where this type of energy source constitutes a realistic danger of substantial unfavourable impact on the ecosystem of the water course and populations of water vertebrates and invertebrates refrain from construction of minor water power plants.
6. Provide for minimization of environmental risks in the use of biomass as an energy source (sustainable production of biomass, compliance with the environmental limits in the use of residual biomass – twigs in felling, etc.; the precautionary principle in introducing new crops; minimization of utilization of chemical protective means and fertilizers). In production, employ technology minimizing these risks and permitting sustainable use of natural resources.

7. Comply with manipulation rules and the set minimum flow rates in relation to hydro-electric production, and, in the construction of minor water power plants, ensure that sufficient quantity water is maintained in water courses. In construction and reconstruction of structures on water courses serving for energy production, provide for passage of migrating fauna through water courses.
8. On the basis of implemented Directive 2003/96/EC restructuring the Community framework for the taxation of energy products and electricity, introduce a fiscally neutral environmental tax reform, with the possibility of subsequent full or partial controlled tax exemption or reduced tax rates for environmentally sound energy products and electricity.
9. Affect the internal market in electricity and gas by taking into account environmental priorities and enable choice of suppliers of environmentally sound production of electricity and biogas with the aim of encouraging the use of renewable energy sources.
10. Secure energy-production facilities against injuring living organisms (e.g. measures against electrocution of birds on distribution facilities).



## I. Introduction


Healthy and good environment is a basic precondition for development of tourism which is becoming one of the most important socio-economic and cultural phenomena of the modern society. Tourism can assist in development that stabilizes the appearance and function of the local landscape and has a sustainable character; on the other hand, it can cause spatial, qualitative and social degradation of the landscape or accelerate this degradation. This, consequently, results in reduction of biological and cultural diversity. Therefore, it is essential to direct the development of tourism so that the unfavourable impact is reduced and the positive impact on the individual components of biodiversity increased.

According to WTO/OMT (World Tourism Organization), tourism can be understood as “activities of people travelling to places outside their usual environment or staying in these places for a period of up to one year for the purpose of leisure activities, business or other purposes.” Sustainable tourism is based on sustainable production and consumption patterns, facilitates conservation and renewal of ecosystems and healthy life style in accordance with nature. It contributes to creation of jobs for the local population and respects and supports their culture and interests and complies with international laws for environmental protection.<sup>9</sup>

**The impact of tourism** on biodiversity can be **negative, neutral** or even **positive**. Due to its infrastructure, supplies of the related “essential” products and the actual behaviour of visitors, mass and environmentally unsound tourism usually creates pressure on local ecosystems that is intolerable in the long term. This pressure includes threats to biodiversity either through direct damaging of flora and fauna by the visitors (collection, trampling, killing, disturbance, etc.) or, indirectly, due to their demands for comfort provided by the place of visit (particularly construction of transport routes, ski slopes, cableways, accommodation and catering facilities, sports fields, etc. which causes destruction of or at least damage of fauna and flora habitats, *inter alia*, due to light, heat and noise pollution and fragmentation of the surrounding landscape). In contrast, conscientious or even professionally oriented tourism often includes, not only attempts to conserve the given ecosystems, but, in case of certain impairment, even increased efforts to renew the original (natural) state of affairs.

In cooperation with UNEP and WTO/OMT, the Subsidiary Body on Scientific, Technical and Technological Advice of CBD (SBTTA) prepared the “*Guidelines for Activities Related to Sustainable Tourism Development and Biological Diversity in Vulnerable Ecosystems*” (hereinafter the “Guidelines”).

Historical observations indicate that self-regulation of the tourism towards the sustainable use of biological resources has only rarely been successful (Decision V/25). It is necessary to acknowledge and support the sustainable tourism and ecotourism as a viable growing segment with a significant potential for contribution for the biodiversity conservation and sustainable use (Decision VI/14).



## II. Current Conditions

In response to the prevailing patterns of tourism characterized mainly by high consumption and mass activities tourism, alternative means of tourism have developed, including the most important and most favourable type from the viewpoint of biodiversity, **ecotourism**. This is an environmentally responsible manner of tourism which depends on existence and conservation of biodiversity as it is developed primarily in naturally interesting and valuable localities and areas. In wider sense, it is an approach, a philosophy of travelling, rather than a form of tourism based on special interest of visitors in gaining knowledge of nature and, at the same time, participation in its protection or sustainable development of the visited area. This type of tourism is not concerned only with specially protected parts of nature, but also with landscape used for farming, vicinity of artificial water reservoirs, etc. Strategic materials are currently being prepared to ensure environmentally sound tourism.

The current patterns of tourism in the Czech Republic (unlike, e.g., Austria or Switzerland) are characterized by mass activities and high consumption; short-term profits are usually preferred to a long-term strategy of sustainable use of the potential of land and its biodiversity. However, there are clear attempts to follow international environmentally favourable trends, which is clear from the objectives of the Concept of the State Tourism Policy (MRD, 2002, thereafter CSTP), the State Environmental Policy of the Czech Republic (ME 2004, hereinafter SEP) and the State Nature Conservation and Landscape Protection Programme of the CR (ME 1998, hereinafter SNCLPP CR).

### UNFAVOURABLE IMPACTS OF TOURISM ON ENVIRONMENTAL COMPONENTS

- **complex impairment of ecosystems** (particularly mountain ecosystems - see the Mountain Ecosystems chapter)
  - impairment of habitats of local species (see the *In-situ* Biodiversity Conservation chapter); impact on changes in their mortality or reproduction patterns; impairment of the vegetative and soil cover; (see Grassland and Mountain Ecosystems chapter)
  - impairment of stability of slopes; eutrophication of water and soil; impairment of the regeneration capacity of ecosystems and fragmentation of the landscape (impairment of bio-corridors and, in some cases, also bio-centres)
- **erosion** - trampling; anthropic and anthropogenic erosion; acceleration of the natural erosion; collection and damaging of natural specimens
- **impairment of populations** - change in the composition of tree species; introduction of non indigenous (allochthonous) species of flora; expansion of invasive species
- **land use** - unsuitably localized and implemented construction of tourism infrastructure (particularly construction of ski resorts in territories with ecosystems rich in species); related air, soil and water pollution; light, heat and noise pollution; exhalations and vibrations on connecting transport routes; pollution of soil and withdrawal of local resources, particularly water
- **management**
  - prolonging the winter season by creating artificial snow; deforestation; construction of paths; identification of unsuitable routes; undisciplined movement of tourists in the terrain (trespassing, shortcutting, duplication of routes)
  - unauthorized mountain climbing, paragliding or white-water sports (canoeing, rafting); use of motor boats; unsuitable behaviour of visitors (in particular, noisiness, non-compliance with the visitors' rules in protected areas, particularly unauthorized camping, hunting or fishing); excessive size of groups or their temporal and spatial concentration; employed means of transport (excessive share of highway individual transport compared to use of public transport, particularly railway transport)

- transport on unpaved routes and off-road transport; lack of knowledge of natural values and rules of ecosystems; unwillingness to respect the principles of sustainable behaviour in nature; inadequate knowledge and, therefore, also application of the principles of sustainable provision of tourism services in ecologically vulnerable areas
- inadequate incentives for the private sector to ensure sustainable use of biodiversity for development of tourism; frequently also insufficient equipment of employees of administrative authorities for providing such incentives



### III. Problem Issues

1. In certain areas, unfavourable environmental impact of tourism has currently been predominant, while the potential for positive influence of tourism on the environment is inadequately employed.
2. Application of the principles of environmentally sound tourism has been currently inadequately supported by public awareness, methodology, economy and legislation and is hindered particularly by lack of understanding of the long-term relations between tourism and biodiversity, as its source and intrinsic value.
3. Unfavourable impact of tourism on natural components of the environment. (Decision V/25 - Potential impact of tourism on biodiversity, Part II; see the box above).



### IV. Objectives

1. Strive to improve the quality and develop infrastructure for environmentally sound forms of tourism and to ensure conservation and improvement of the quality of the environment and sustainable development so that the local population enjoys benefits of sustainable development, such as job creation and the sharing of benefits arising from the sustainable use of biodiversity for tourism purposes where small and medium-sized enterprises should play a major role in this regard (Decision V/25, CSTP, SNCLPP CR).
2. Promote sustainable tourism, especially ecotourism, as an important mechanism for the conservation and sustainable use of biological diversity in order to encourage responsible behaviour on the part of visitors and tourism enterprises and the local population (Decision V/25, CSTP, SEP, SNCLPP CR).
3. Encourage environmentally sound transportation, particularly in protected landscape areas and national parks (CSTP, SEP, SNCLPP CR).
4. Increasingly use the potential of subsequent benefits ensured by sustainable operation and development of tourism, particularly ecotourism, for maintaining biodiversity: creation of resources for financing conservation of biodiversity (particularly in specially protected areas); creation of environmentally sound alternatives for economies of the population of protected areas; economic justification of existence or extension of protected areas; creation of environmentally oriented demand for use of the potential of protected areas; an instrument of environmental education and encouraging of the private sector to conserve biodiversity.
5. Develop cooperation between nature conservation and development of tourism in order to create a line of environmentally sound tourism products (CSTP).
6. Encourage demand for environmentally sound tourism products (CSTP, SEP, SNCLPP CR).
7. Draw up a clear strategy for the development of ecotourism that would ensure full and effective participation and viable income-generating opportunities for the local population (Decision V/25).
8. From the spatial viewpoint, it will be necessary to concentrate on reduction of unfavourable impact and employing the potential for positive influence of environmentally sound tourism in Natura 2000 sites and mountain ecosystems of the Czech Republic.

## Related documents

The Berlin Declaration On Biological Diversity And Sustainable Tourism (International Conference of Environment Ministers on Biodiversity and Tourism 6-8 March, 1997, Berlin)

Integrating Biodiversity into the Tourism Sector: Best Practice Guidelines (Hector Ceballos-Lascurain, 2001)

“CR Conception on the state policy on the tourism for 2002 - 2007”, MRD 2002

Council Resolution of 22 December 1986 on a better seasonal and geographical distribution of tourism (86/C340/01)

European Charter for Sustainable Tourism in Protected Areas (European Commission 1991)

Council Directive 95/57/EC of 23 November 1995 on the collection of statistical information in the field of tourism

Opinion of the Committee of Regions to the rural tourism in the regions of the European Union EU (95/C210/17)

Agenda 21 for the Travel and Tourism Industry (WTO, WTTC and Earth Council, Decision of the 7<sup>th</sup> Meeting of the UN General Assembly and the UN Commission for sustainable development (New York, 19- 30 April 1999) No. 7/3 „Tourism and sustainable development“

“Guide for Local Authorities on Developing Sustainable Tourism” (WTO/OMT 1998)

Guidelines: Development of National Parks and Protected Areas for Tourism (WTO/OMT 1992)

Charter for Sustainable Tourism, World Conference on Sustainable Tourism, Lanzarotte (1995)

Tourism, ecotourism, and protected areas “The state of nature-based tourism around the world and guidelines for its development. (ed. Hector Ceballos-Lascurain, IUCN 1996): Global Code of Ethics for Tourism (WTO/OMT 1999)

Sustainable Development of Tourism: “A Compilation of Good Practices” (WTO/OMT 2000)

Sustainable Tourism, and Natura 2000. Guidelines, initiatives and good practices in Europe (SECA 2001)

UNEP Principles on Implementation of Sustainable Tourism. (UNEP 2001)

“Defining, Measuring and Evaluating Carrying Capacity In European Tourism Destinations” B4-3040/2000/294577/Mar/D2 Final Report (EK 2001)


„Biological Diversity and Tourism: Draft guidelines for activities related to sustainable tourism development and biological diversity“ (UNEP/CBD/SBSTTA/8/11) (Tourism and Biodiversity - Mapping Tourism’s Global Footprint (Conservation International 2003)

CBD COP Decision V/25 - Biodiversity and Tourism

CBD COP Decision VI/14 - Biodiversity and Tourism

CBD COP Decision VII/14 - Biodiversity and Tourism






## I. Introduction

Climate is defined as the average long-term state of the atmosphere in a certain geographic area. In the concept of the UN Framework Convention on Climate Change, climate change is defined as change of climate which is attributed to human activity. However, the resulting change is also affected by the natural climate variability; the two components cannot be separated and, at the current state of knowledge, even quantified with adequate accuracy. Therefore, where reference is made to the consequences of the climate change for changes in biodiversity, the combined effects of both these components must be taken into account.

The available scientific knowledge and the experience to date indicate a close mutual interconnection of the Convention with the Convention on Biological Diversity; consequently, the IPCC (UN Intergovernmental Panel for Climate Change) Technical Paper was drawn up in 2002 in this respect.<sup>10</sup> On global scale, human activities have caused and will cause changes in biodiversity through changes in the use and character of the landscape, pollution of the soil, water and air, transition to more intensive management in ecosystems, increased orientation on urban systems, more intensive utilization of species of flora and fauna, and introduction of geographically non-indigenous species of fauna and flora to the new environment. An absolutely recent issue is concerned with the degree to which the climate change (both natural and anthropogenic) could increase or limit losses of biodiversity in both near and longer future.

Although Central European ecosystems are not as vulnerable to the climate change, as, e.g. coral reefs, mangroves or dry areas, nevertheless, the effects of long-term climate change are an important factor endangering all types of ecosystems. The climate change could also affect spreading of invasive alien species and sustainable use of biodiversity in managed ecosystems. Inadequately flexible ecosystems endangered by the biodiversity loss might not bear any additional stress caused by the climate change which could also be reflected in the provision of ecosystem services such as food production.

These are the main reasons why attention must be paid to the aspects of mutual interconnection of the two Conventions, with emphasis on regional specificities.



## II. Current Conditions

According to the results of the National Climate Program<sup>11</sup> of the Czech Republic, findings have been acquired on the potential impact of the climate change on individual sectors of human activities. This impact is manifested particularly by changes in the hydrological balance, surface waters and groundwater regime, reserve volumes of water reservoirs and the quality of surface waters (see the Inland Water and Wetland Ecosystems chapter); while, in details and in the individual river basins, the manifestations of these changes vary, the fundamental changes in the hydrological process have a similar character on the regional scale.

<sup>10</sup> *Climate Change and Biodiversity*, IPCC Technical Paper V, IPCC, 2002, 76 pp.

<sup>11</sup> Scenarios of the climate change in the Czech Republic and estimated impact of the climate change on the hydrological regime, agriculture, forest management and human health in the Czech Republic, the National Climate Programme of the Czech Republic, issue 32, Prague 2002.

As the direct outflow caused by melting of snow in the spring, as well as the annual basic outflow, is decreasing, there has been a significant decrease in the total outflow from river basins throughout the year. Winter periods are exceptional in this respect as the accumulation of snow is lower due to higher temperatures. The current scenarios of the climate change indicate reduced inflow of water to groundwater and the consequent reduction in the reserves of groundwater, which is markedly manifested in reduction of the minimum flow rates in water courses.

The climate change can directly affect the spreading of species of flora and fauna, including invasive alien species, particularly by reducing the availability of water sources and decreasing the extent of the environment, and particularly species bound on the aquatic environment. An important role is also played by accelerated succession of phenological phases, prolonging of the vegetation period, altered migration conditions for species of fauna and earlier laying of eggs (e.g. with respect to some economically important pests in forestry or agriculture, this could even result in occurrence of further generations). In a number of cases, the observed changes are consistent with the already known biological responses to climatic conditions.

As the individual species react to the climate change primarily by migration and only subsequently by genetic adaptation, ecosystems can gradually change their composition, structure and function. According to scenarios drawn up to date, e.g. broad-leaved trees will penetrate deeper to coniferous forests and mixed forests will spontaneously expand; conifers are likely to decrease. A majority of climate scenarios indicate, e.g. a shift of boreal forests by up to several hundreds of kilometres to the North. They also indicate that the conditions for growing our most important field crop (winter wheat) will be similar at elevations around 600 m above sea level (a.s.l.) to the current conditions at elevations of 300 m a.s.l. A separate area includes the effects of increased concentrations of CO<sub>2</sub> in the air which will result in a higher intensity of photosynthesis, which could lead to higher production of biomass if the supply of water is adequate.

The diversity of conditions in habitats and the relatively wide range of scenarios of the anticipated climate change do not permit unambiguous and common determination of impact of the climate change on biodiversity in the conditions of this country and, therefore, adoption of a single type of measures is unrealistic.

In general, it can be stated with respect to the Czech Republic that:

- the current scenarios anticipate a certain warming, prolonging of the vegetative period, a change in the distribution of precipitation, lack of water due to increased evapotranspiration and increased occurrence of extreme climate phenomena;
- the natural ecosystems will be affected by disappearance of certain species and spreading of other species, including pathogenic and invasive species in the direction of increasing longitude and elevation;
- substantial changes or even eradication of certain original ecosystems can be anticipated given the fragmentation and small size of areas in the Czech Republic, without respect to the location of the ecosystems in the Czech Republic;
- warming stimulates migration of animal species;
- managed artificial ecosystems will be endangered particularly in lower regions of the Czech Republic, where availability of water is already a limiting factor and where substantial occurrence of the current and newly migrating pathogens can be expected.

Neither the State Nature Conservation and Landscape Protection Programme of the Czech Republic (1998) nor the State Environmental Policy of the Czech Republic pays special attention to the issues of climate change in relation to biodiversity. The only well-analyzed issue is concerned with reduction of emissions of greenhouse gases; however, without any closer relation to the impact on biodiversity.

### III. Problem Issues

1. The potential impact of the climate change on biodiversity has been ascertained only on the basis of scenarios drawn up primarily for economic ecosystems, rather than for biodiversity and agriculture.
2. There is no integrated monitoring system covering changes in biodiversity in relation to the climate change, particularly distribution of species and changes in the structure and functions of habitats important from the viewpoint of conservation of biodiversity (see the Strategy of Research on Biodiversity chapter).
3. Changes in utilization of soil and measures to mitigate the climate change are not adequately interconnected with the conservation of biodiversity.
4. Impact of the climate change will expose species of flora and fauna to the necessity of facing new competitors, diseases and invasive species.
5. In mountain areas, increased temperatures will lead to vertical movements of biotic and cryospheric zones with consequent effects on the hydrological cycle.
6. As a consequence of prolonging of the vegetative period and higher temperatures, species of fauna and flora will be redistributed, with a possibility of their extinction or extinguishment of entire ecosystems (e.g. alpine). Similar impact will be borne by some unique ecosystems, e.g. grassland ecosystems and wetlands.
7. The climate change will be accompanied by increasing variability of meteorological phenomena; more frequent meteorological events may impair, from the viewpoint of biodiversity, all types of natural and economically used ecosystems.
8. The risk of flood rains, inundation and floods grows and is also accompanied by increasing soil erosion; unfavourable effects are observed particularly in more articulated terrain and in lower reaches of rivers. Changed temperatures and hydrological conditions will endanger the composition of aquatic ecosystems and the occurrence of flora and fauna bound on water.
9. In agriculture, a change in the climate conditions will result in a need to cultivate new crops and varieties and the need for irrigation, while in forestry, it will require that issues be resolved with respect to the changed composition of tree species in relation to the increased action of pathogens and decomposition of spruce stands in lower areas and changes in the manner of management in connection with carbon sinks.

### IV. Objectives

Comprehensive protection of the Earth's climate system is dealt with for the Czech Republic in the National Programme to Abate the Climate Change Impacts in the CR (Resolution of the Government of the Czech Republic No. 187/2004).

The objectives for conservation and sustainable use of biodiversity with respect to the climate change include:

1. support research of impact of the climate change and increased climate variability on biodiversity and the response of ecosystems to the climate change;
2. estimate the potential for conservation and sustainable use of biodiversity within adaptation measures prepared for mitigating the impact of the climate change;
3. encourage gradual introduction of suitable adaptation measures particularly in the above-mentioned selected sectors and estimates of economic costs;
4. estimate the potential impact of measures to increase sinks of greenhouse gases (planting of new forests), to ensure more intensive use of biomass as fuel (planting of plantations of fast-growing tree species), and to

encourage construction of minor water power plants (changes in local flow rates in small water courses) on biodiversity;

5. draw up and unify or modify, as appropriate, a set of adaptation measures responding to the climate change for the purpose of minimizing the unfavourable impact on biodiversity;
6. increase the importance of Specially Protected Areas and ecological networks (particularly TSES) for migration of the components of biodiversity;
7. strengthen the mutual interaction of the UN Framework Convention on Climate Change and the Convention on Biological Diversity in the context of sustainable development, both on the scale of international cooperation and particularly on the national and regional scale.

### **Related documents**

UN Framework Convention on Climate Change (UNFCCC) (<http://unfccc.int/resource/docs/convkp/conveng.pdf>)

Kyoto Protocol to the UNFCCC (<http://unfccc.int/resource/docs/convkp/kpeng.pdf>)

UN International Panel for Climate Change (<http://www.ipcc.ch>)

Climate Change and Biodiversity , IPCC TP (<http://www.chmi.cz/nkp/nkp.html>)


National Programme to Abate the Climate Change Impacts in the Czech Republic  
(<http://www.env.cz/www/klima.nsf>)

National Climatic Programme of the Czech Republic (<http://www.chmi.cz/nkp/nkp.html>)

Scenarios of climate change in the Czech Republic, assessment of climate change on hydrological system, agriculture, forest management and human health, NKP, sv. 32, Praha 2002

Ad Hoc Technical Expert Group on Biological Diversity and Climate Change (Helsinki, Finland, 10.-14.6.2003,  
<http://www.biodiv.org>)

CBD COP Decision VII/15 - Biodiversity and climate change



## I. Introduction

The **Convention on Biological Diversity (CBD)** is globally considered being the most important instrument dealing with international biodiversity conservation and management. A vast majority of UN Member States, as well as the European Community (EC), have become the Contracting Parties to the Convention. Effective implementation of CBD requires cooperation with other international multilateral conventions concerned with a certain aspect of biodiversity management. Due to the considerable extent of the subject covered by CBD (from the issue of genetic diversity to the aspect of ecosystem diversity), each country needs to find its own priorities which it will then pursue.

A Joint Liaison Group (JLG) of three international conventions - CBD, UNCCD and UNFCCC - was established in December 2001. Implementation of joint programmes of work of CBD and other conventions (*e.g.*, the Ramsar Convention, UNCCD, CMS) has proved suitable in biodiversity conservation, including utilization of the substantial practical experience of the relevant conventions, with simultaneous support for the efforts of UNEP (the organization responsible for multilateral international environmental agreements) so that as many UN member countries as possible become their Parties. Basically the same is true for cooperation with the United Nations technical agencies and programmes (FAO - agricultural biodiversity, UNESCO - protected areas, education, training and public awareness, UNFF - forest biodiversity, IPCC - global climate change, CSD sustainable development) other international intergovernmental organizations (OECD, World Bank, etc.) and NGOs. Special attention is paid to the politically sensitive cooperation with the World Trade Organization (WTO). An important role is also played by the private sector and other stakeholders, both on global and on continental and national scale.

At the global level, the *Strategic Plan* approved by the 6<sup>th</sup> meeting of the CBD Conference of the Parties, attempts to determine unambiguous priorities in implementation of CBD. A really effective cooperation of all stakeholders on the national, Pan-European and global scale, as well as in the framework of EU, in implementation of CBD, is even more urgent as the rather ambitious objectives adopted at the highest political forums (meeting of the European Council, Gothenburg, September 2001; the 6<sup>th</sup> meeting of the Conference of the Parties of CBD, Haag, April 2002; WSSD, 2002; the 5<sup>th</sup> Conference of UN Environment for Europe) cannot be achieved without increased efforts by pursuing "business as usual".



## II. Current Conditions

After 1989, Czech and Slovak Federative Republic (CSFR), and later the Czech Republic, became a contracting party to all international multilateral agreements concerning biodiversity. These agreements include: **Convention On Wetlands Of International Importance Especially As Waterfowl Habitat** (Ramsar Convention, 1971); **Convention on the Conservation of European Wildlife and Natural Habitats** (Bern Convention, 1979); **Convention on the Conservation of Migratory Species of Wild Animals** (Bonn Convention - CMS; 1979) and the regional agreements concluded in its framework; **UN Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa** (Convention on Desertification - UNCCD, 1992); **Convention on International Trade in Endangered Species** (CITES,

Washington Convention, 1973); **Convention Concerning the Protection of the World Cultural and Natural Heritage** (UNESCO, 1972).

Other multilateral international conventions to which the Czech Republic is a party and which contain commitments to conserve biodiversity include, e.g.: **UN Framework Convention on Climate Change** (UNFCCC, 1992); **UN Convention on the Law of the Sea** (UNCLOS, 1982); **Vienna Convention for the Protection of the Ozone Layer** (1985); **Montreal Protocol on Substances that Deplete the Ozone Layer** (1987); **Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade** (PIC, 1998); **Stockholm Convention on Persistent Organic Pollutants** (2001); **UN ECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes** (1992); **Convention on Cooperation for the Protection and Sustainable Use of the Danube River** (1994); **Agreement on Establishment of the International Commission for the Elbe River Protection** (1990); **Agreement on the International Commission for Protection of the Odra River Against Pollution** (1996); **International Treaty on Plant Genetic Resources for Food and Agriculture** (FAO, 2001).

Unfortunately, the Czech Republic frequently acceded to these conventions without subsequently creating the necessary, if not the optimum, capacity for fulfillment of the obligations following from them. At the central level, the international obligations were provided for, since its establishment, by the ME Nature Conservation Department. However, the implementation capacity was inadequate. A separate International Biodiversity Conservation Department was established at ME in 2003. It is the National Focal Point and the expert guarantor of a majority of conventions in nature and biodiversity conservation within the responsibilities of ME. The actual international activities supporting implementation of CBD in the Czech Republic are also ensured by other sectors, particularly by the Ministry of Agriculture (particularly cooperation with FAO, participation in the **Ministerial Conference on the Protection of Forests in Europe** (MCPFE)), sectoral research institutions, universities, Academy of Science of the Czech Republic, the private sector and, last but not least, NGOs. Furthermore, international cooperation successfully developed in the cross-border context was originally ensured by districts and currently by the regions; this usually involves cooperation on a smaller scale consisting in specific projects.

In early 1990s, the Czech Republic became a recipient of financial, methodical, professional and other assistance from abroad, concerned with improvement of the state of the environment. This assistance was usually provided in the form of various projects, training courses and transfer of experience by the governments of the EU Member States, the Communities as a whole, U.S.A. and other economically developed countries, international intergovernmental and non-governmental organizations, non-governmental organizations of certain countries and private funds and foundations. With the gradual development of Parliamentary democracy and market economy and with the accession of the Czech Republic to OECD (December 1995), the position of the Czech Republic gradually changed from the recipient of the aforementioned assistance to its future donor. It is expected that a member of the Organization for Economic Cooperation and Development (OECD) will financially contribute to developmental assistance. In January 2002, the Government of the Czech Republic took into cognisance the *Concept of Official Developmental Assistance of the Czech Republic for the 2002 - 2007 period* with emphasis on poverty alleviation and the environment in less developed countries by means of sustainable development.



### III. Problem Issues

1. Adequate capacity for fulfillment of obligations following from multilateral international agreements has not been built to date.

2. Obligations following from these international conventions and agreements that are relevant for the Czech Republic have not been fully identified to date.
3. Interministerial and intersectoral cooperation concerned with competence and responsibilities in international cooperation is not adequately functioning and interconnected.
4. State institutions, non-governmental organizations, universities and other institutions are not adequately informed of international conventions and activities. The activities are not mutually linked and efforts are frequently duplicated or, in contrast, there are gaps in fulfilment of obligations.
5. Official Development Assistance projects are currently limited mainly to activities focused on geology; shifting to biodiversity conservation has been lacking.
6. Inadequate awareness raising and provision of information through international documents and publications in the Czech language.
7. Fulfilment of obligations arising from international activities is not evaluated; no overall survey of the individual activities and their outcomes and further development is kept.
8. In certain cases, the competence related to fulfilment of obligations following from international conventions is not accurately allocated; in other cases, the sectors are excessively isolated.
9. Awareness of the general public of the individual international conventions and other international agreements is low; support for enforcement of obligations is lacking.



#### IV. Objectives

1. Establish relevant capacity for fulfilment of obligations following from multilateral international conventions, agreements and protocols concerned with biodiversity conservation of, sustainable use of its components and fair and equitable sharing of benefits arising out of the use of genetic resources, including the procedures of contemporary biotechnology with emphasis on cross-sectoral cooperation and interconnection with the documents approved at the European Communities level.
2. Utilize to a greater degree bilateral international agreements for fulfilment of the aforementioned obligations.
3. Continue cooperation with the relevant international non-governmental organizations and programmes active on the global and Pan-European scale.
4. Encourage participation of governmental agencies and non-governmental organizations in suitable international projects, programmes and initiatives, including those that are concerned with bio-informatics, and in projects of communication, training and education.
5. Allocate part of the Official Developmental Assistance of the Czech Republic for support for implementation of CBD in beneficiary countries as an integral part of sustainable development, both in the form of specific projects and by means of professional and methodical support in capacity building (e.g. GTI support) in accordance with the 6<sup>th</sup> EC Research Framework Program.
6. Enhance the public awareness of the commitments of the Czech Republic following from the EC legislation and the individual multilateral international agreements concerning the biodiversity conservation, particularly CBD, and obtain support for actual performance of these commitments.
7. Therefore, the Czech Republic, as an EU Member State, will have to concentrate in near future also on actual, rather than formal, implementation of these priorities which are valid for the EU as a whole. Achieving this objective is hardly conceivable without a genuine interministerial and cross - sectoral approach, building the required capacity and adequate political support.
8. Utilize and finalize the fully functioning CBD Clearing House Mechanism (CHM) which will enable exchange and sharing of information on international cooperation at the international, national, regional and local levels.

## **Related documents**

### **EUROBATS**

Secretariat of the CBD (2003): Handbook of the Convention on Biological Diversity, 2nd ed. (Updated to include the outcome of the sixth meeting of the Conference of Parties). Secretariat of the Convention on Biological Diversity Montreal, 937 pp.

UNEP (2003): Cooperation with other organisations, initiatives and conventions. UNEP/CBD/COP/7/19. Secretariat of the Convention on Biological Diversity Montreal, 16 pp.

CBD COP Decision II/13 - Cooperation with other biodiversity-related conventions

CBD COP Decision III/21 - Relationship of the Convention with the Commission on Sustainable Development and biodiversity-related conventions, other international agreements, institutions and processes of relevance

CBD COP Decision IV/15 - Relationship of the Convention with the Commission on Sustainable Development and biodiversity-related conventions, other international agreements, institutions and processes of relevance

CBD COP Decision VI/20 - Cooperation with other bodies

CBD COP Decision VII/26 - Cooperation with other bodies



### A

**Acidification** - acidification of the environment caused by atmospheric deposition of sulphur and nitrogen oxides. One of the main causes of damage to forest stands.

**Adaptation** - the process of alteration of the organism during its ontogenesis during the life-span; characteristics incurred by adaptation to the living conditions. It documents the previous experience of the organism with the environment; where the factors of the environment are mainly constant, adaptation is a guarantee of survival. Adaptations are classified to morphological, physiological and ethological.

**Adventive species** - additional, actively or passively relocated species from some other area or biocenosis, introduced by humans and escaped or domesticated in the new area.

**Agenda 21** - the final document from the UN Conference on the Environment and Development in Rio de Janeiro, 1992. It is an action plan of sustainable development for the 21<sup>st</sup> century.

**Agroecenosis** - an annual or shorter community on fields or other agricultural land. In case of inadequate management, it undergoes very rapid succession (change into a fallow area).

**Allochthonous** - non-indigenous, alien populations, organisms or non-living natural objects that developed or evolved at a different site from which they actively or passively moved to the site of their current occurrence. Allochthonous organisms that suppress indigenous organisms or cross-breed with them and thus impair the original gene pool are considered to be undesirable.

**Alpine zone** - high mountain vegetative zone above the forest line (in the Czech Republic, above 1,400 m a.s.l.).

**Animal or plant species** - also a lower systematic unit (Act No. 114/1992 Coll., ).

**Anthropogenic** - created, changed or affected by humans or their activities.

**Applied research** - Research aimed at socially and economically important issues (also “oriented research”).

**Atmospheric deposition** - deposition of an atmospheric substance on the surface of the Earth. It is measured as an amount (t, kg, mg, µg) per unit of the surface of the Earth during a time period. Atmospheric deposition is classified as dry, wet and acid.

**Autochthonous** - original indigenous population, organisms (plants, animals) or non-living natural objects (rocks, minerals) developed at the site of their current occurrence.

**Awareness raising** - includes various educational and training activities aimed at the general public or target groups of the population (children, farmers, senior officers). Publishing activities include bulletins and journals intended for communication with the general public, technical and popular publications, methodical documents for environmental education, etc. Events intended for the general public include celebrations of the Earth Day and other important days (Day for Biological Diversity, Day without Cars, World Water Day, etc.), ecological evenings, excursions and trips in nature, exhibitions, fairs, concerts, film festivals, presenting the Prizes of the Minister of the Environment, organization of competitions – e.g. competitions for the best thesis in this area, etc.

### B

**Bank vegetation** - tree stands and bushes along water courses (willows, alders, ashes, maples), strengthen banks, improve the microclimate, provide a refuge for animals, have a landscaping and aesthetic value.

**Basic research** - Research activities aimed at obtaining fundamentally new finding enriching human knowledge.

**Biocenosis** - a community or group of populations of all species of plants, animals, fungi and micro-organisms occupying a certain space at a certain time (habitat).

**Biodiversity (Biological diversity)** - emphasises the diversity and heterogeneity of organisms and their environment.

Biological diversity was established as a new concept integrating all levels of the living world from genes to ecosystems in the mid 1980s (Wilson 1988).

It means the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems (Convention on Biological Diversity, 1992).

It can be understood as diversity of living organisms, natural resources and ecosystems of which they are part (UNEP, 1995).

Therefore, this concept includes, not only the number, but also the variety of species and ecosystems and genetic diversity which they include (WRI/IUCN/UNEP, 1992). Thus, biodiversity is defined as the diversity of life in all its forms, levels and combinations.

However, this is not only a mere aggregation of all genes, species and ecosystems, but rather variability within and between them. Therefore, biodiversity in this sense is considered to be a characteristic of life.

A renowned American biologist, E.O. Wilson who popularized the term biodiversity and disseminated it outside the scientific circles, understands it as the diversity of organisms at all levels, from genetic differences within a single species and groups of species to groups of genera, families and higher taxonomic levels; it includes the diversity of ecosystems consisting of communities of organisms in a certain habitat and under physical conditions in which they live (Wilson 1988, 1992).

**Bioindication** - estimate of the state of the environment by presence or numbers of various organisms. It is used to monitor various environmental risks. Currently, both plant and animal species are used, e.g., to determine short-term survival in an artificially developed habitats with a defined harmful substance, for estimates of population trends and trends at the level of communities, etc.

**Biological resources** - include genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems (biota) with actual or potential use or value for humanity.

**Biome** - a group of ecosystems within the terrestrial biocycle in a certain geographical zone with a characteristic type of vegetation and fauna, corresponding to certain environmental conditions. For each and every biome, there is a characteristic season, duration of the day, amount and type of precipitation, and temperature. The basic character is defined by the climate. (tropical rainforest, boreal forest, deciduous broad-leaved forest, tundra, steppe, savannah, sclerophyllous forests and bushes, semi-deserts and deserts, ice deserts and permanent ice).

**Biotechnology** - any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use.

**Habitat** - is a set of all non-living and living factors which, in their mutual interactions, create the environment, a certain specimen, species, population or community. Habitat is a local environment which meets the requirements characteristic for species of flora and fauna (Act No. 114/1992 Coll.).

**Birds Directive** - Directive 79/409/EEC on the conservation of wild birds. This Directive is concerned with conservation of all species of wild birds in the European territory of the EU Member States. It includes conservation and regulation of these species and their management and stipulates the rules for their use.

**Breeding** - any keeping of animals in captivity (Act No. 114/1992 Coll., ).

**Brownfields** - formerly built-up, unused or little used industrial areas in cities; after stopping production, they were left abandoned and slowly deteriorate.

## C

**Carbon sink, carbon binding** - a process where carbon is absorbed from the air particularly by green plants and soil and binding of carbon in the form of carbonates by marine organisms.

**CARP** - Concept of Agrarian Policy of CR for the period after accession to EU (2004-2013).

**CBD Committee** - an advisory body established at ME for implementation of the Convention on Biological Diversity in the Czech Republic. Its members include representatives of individual ministries, Academy of Sciences of the Czech Republic and NGOs. Representatives of scientific, research and expert institutions, institutes of the Academy of Sciences of the Czech Republic and universities, are members of the Scientific Advisory Board of the Committee. The Committee usually meets twice a year. The competent Deputy Minister of the Environment is the chairman of the Committee.

**Genosis (community)** - a group of populations of organisms living in a common environment and bound by ecological relations. Most frequently, any individual part of a biocenosis.

**Clearcutting** - a type of renewal management during which all trees are felled in the renewed stand or part thereof. The minimum width of the clearcut area is also defined – it must exceed the average height of the renewed stand. Clear felling on areas that are narrower than the height of the felled stand are classified as partial clearcutting. According to the applicable legislation, felling is permitted up to the area of 1 ha, where the width of the felling may not exceed twice the height of the felled stand. (Poleno et al., 1994: Forestry dictionary, MA, Prague)

**Climate** - characteristic “average” weather of a certain area or region during a period of several decades, including its statistical description (according to the definition of the World Meteorological Organization, usually for a period of 30 years).

**Climate change** - long-term climate change in a certain region or the entire planet caused by both natural factors and as a consequence of human activities.

**Climate scenarios** - acceptable expression of the future climate developed for direct use in research of potential impact of an anthropogenic climate change.

**Climate system** - system consisting of atmosphere, hydrosphere, cryosphere, Earth’s surface and biosphere and including their mutual interactions.

**Climate variability** - changes in average values and statistical characteristics of occurrence of meteorological factors.

**Clone archive** - archive of genetically identical cells or specimens (clones) developed from a single cell by fission or reproduced from a single specimen in a vegetative manner.

**Component** - part.

**Landscape** - part of the Earth’s surface with the characteristic relief, consisting in a set of functionally interconnected ecosystems and civilization elements (Act No. 114/1992 Coll.).

**Conservation *ex-situ*** - means conservation of the components of biodiversity outside their natural habitats (habitats).

**Conservation *in-situ*** - means conservation of ecosystem and natural habitats including maintenance and recovery of viable populations of species in their natural environment and, in case of domesticated or cultivated species in the environment, where their characteristic properties were developed.

**Consultancy (environmental)** - provision of the required information on the environment in an attempt to encourage a reasonable relation of the applicant to nature and the environment. This includes particularly preventative environmental management and an effort to promote cooperation and communication between the key sectors in society - self-government, state administration, scientific research, the general public and business sector.

Environmental consultancy aims at disclosing to the citizens objective and comprehensive information on the environment, environmental issues and solutions, products and their environmental impact. Thus, environmental consultancy contributes to raising environmental awareness within the population and building of civic structures that act as a counter-balance to unilateral political or economic decisions. Consultancy centres respond to specific inquiries, facilitate finding practical solutions to the given problem in the given area and time or in the given legal case, on the basis of requirements of the citizens and institutions.

**Country of origin of genetic resources** - the country which possesses those genetic resources in *in-situ* conditions.

**Country providing genetic resources** - the country supplying genetic resources collected from *in-situ* sources, including populations of both wild and domesticated species, or taken from *ex-situ* sources, which may or may not have originated in that country.

**Cryosphere** - interrupted Earth's cover consisting of ice, snow and long frozen soil.

## D

**Deforestation** - removing of forest stands by man, usually permanent. This causes irreversible destruction of the original biocenoses, water and wind erosion, soil degradation, etc.

**Degradation** - decline, degeneration, deterioration of the environment caused by pollution of the air (emissions), water and soil. Damage to the environment resulting from its pollution or destruction.

**Diaspora** - part of a plant serving for reproduction (embryo, seed, rhizome, fruit, entire fructus congregatus, parent, bulbillus, etc.).

**Disparities** - unbalances, differences, inequality, disproportion of various phenomena.

**Dispersion** - natural spreading of specimens of a certain population in an area or space.

**Disturbance** - impairment of an ecosystem from the outer environment. Disturbance can be either anthropogenic (degradation) or caused by a natural process (natural disasters).

**Diversity** - diversity, heterogeneity.

**Domesticated or cultivated species** - species in which the evolutionary process has been influenced by humans to meet their needs.

**Drift** - passive movement of organisms in the direction of the relevant force field (water or air flow).

## E

**Edaphic category** - a unit of horizontal classification of an ecological network within a typological classification system where growth conditions are differentiated particularly according to permanent properties of soil. The basis for this differentiation is created by edaphic categories grouped in wider frameworks - ecological series.

**Edaphon** - all living organisms in soil.

**Ecological stability** - state of an ecosystem or landscape characterized by the ability to compensate external disturbances (caused usually by human activities) and internal disturbances without any substantial and long-term damage. Semi-natural ecosystems and landscape units are considered to be ecologically stable.

**Ecosystem** - a functional complex of living and non-living components of the environment that are mutually interconnected by exchange of substances, energy flow and transfer of information and that mutually interact and evolve in certain space and time (Act No. 114/1992 Coll.).

**Ecosystem goods** - products provided by ecosystems and used by humans, such as wood, food or medicinal substances.

**Ecosystem services** - processes and conditions of natural ecosystems that support human activities and maintain existence of mankind on the Earth (photosynthesis, maintenance of the ratio of elements in the air, soil-formation processes, etc.).

**Ecotone** - a transitional zone between two or more ecosystems, e.g. the transition from a meadow to forest. An ecotone has a certain width and is characterized by absolutely special marginal living conditions between individual biomes; its length can equal up to dozens of kilometres. They contain species from all relevant ecosystems and also species characteristic only for the given ecotone.

**Education** - a process of intentional influencing of a person aimed at achieving positive changes in his/her development. Since the 1990s, there has been a gradual shift in terminology in the area of environmental protection - from the term "ecological education" and "environmental education" to the term "education for

sustainable development” and “enlightenment for sustainable manner of life”. In practice, these terms can be considered to be equal. In this, the following principles are followed:

*principle of citizenship of the Earth* (responsibility of an individual for the community and the planet);

*principle of respect for other people* (consequence of seemingly harmless procedures – export of hazardous waste, introduction of GMOs);

*precautionary principle* (effects of interventions in the environment can never be fully predicted);

*principle of reasonable consumption* (products harmless to health and nature);

*principle of actual effectiveness* (the highest possible use of renewable source, effective technology of waste prevention, etc.);

*principle of respect for life* (i.e. not only human);

*principle of own responsibility* (freedom and ownership without responsibility are empty terms);

*principle of self-restraint* (voluntary restraining of material consumption)

Educational events in the area of the environment for teachers are concerned particularly with exchange of experience between teachers, methodical assistance to teachers (practical instructions and instigations, didactic procedures, use of instruments, etc.), technical knowledge of ecology and conservation biology, environmental protection and nature conservation, crafts and handicraft activities. All the above is carried out by means of seminars, field excursions, ecopedagogically oriented teachers, conferences and other means.

**Emissions** - the release of greenhouse gases and/or their precursors into the atmosphere over a specified area and period of time (UNFCCC).

**Emission sinks** - processes absorbing the given substance (mostly carbon dioxide) from the air

**Endemic species** - a plant or animal species which is present mostly on a very limited area (its distribution range is territorially very limited).

**Energy industry** - includes all processes of obtaining, processing, transport, transformation and final use of energy resources in all sectors of economy.

**Eutrophication** - gradual enrichment of soil and water by organic nutrients, particularly nitrogen and phosphorus. Natural eutrophication is a process lasting thousands or tens of thousands of years; however, it can be substantially accelerated by human activities.

**Evapotranspiration** - total evaporation of water from the surface of soil and from the surface of plants including water vapour released by plant stomata.

**Expansive plants** - geographically indigenous plants with a high competitive capacity which excessively spread in their area or penetrate to an area where they previously have not been present; their spreading leads to suppressing of biodiversity in the affected ecosystems.

**Expansive species** - species with a tendency to expand the distribution range (area of expansion) or the area of its habitat (Collared Dove - *Streptopelia decaocto*).

**Explantate culture** - cultivation of tissues, organs or cells in an artificial nursery medium *in vitro*; synonym: tissue culture.

**Extreme climate phenomena** - climate phenomena that fall outside the 10<sup>th</sup> and 90<sup>th</sup> percentile.

## F

**Flood** - substantial temporary increase in the level of a water course caused by a sudden increase in the flow rate or a temporary decrease in the capacity of the channel.

**Floodplain meadow** - a botanical formation of plants consisting of high herbs; geology of a body of sediments that are deposited during floods.

**Forest line** - the boundary of forest stands that is determined by climatic conditions limiting the occurrence of forest given the elevation.

**Forest vegetation zone** - vegetation zone with a determining wood component of a tree height.

**Fossil fuels** - natural substances rich in energy content whose combustion yields heat. They are divided to solid

(black and brown coal, peat), liquid (crude oil) and gaseous (natural gas). They have a high content of carbon or hydrocarbons and are used for energy production in various combustion installations.

## G

**Gene bank** - facility for maintaining the genetic diversity of organisms in the form of seeds, pollen, embryos, cryogenic or tissue cultures or, for field gene banks, in the form of living plants.

**Genetic erosion** - loss of natural variability of a species (breed) due to unsuitable use and/or change of living conditions (e.g. special improvement for high milk production).

**Genetic material** - any material of a plant, animal, microbial or other origin containing functional units of heredity.

**Gene pool** – a complex of all genes in the population of organisms; a complex of all living organisms in a certain area with identical actual and potential hereditary units, genes.

**Genetic resource** - can be any biological material containing genes; however, pursuant to law (Act No. 148/2003 Coll.), a) plant genetic resources include a) a variety of the cultivated plant, regional variety of the cultivated plant; b) a genetic line or wild plant species that can be utilized for nutrition and agriculture; the genetic resource of a micro-organism is species, strain or race of viroids, viruses, phytoplasm, bacteria, yeasts, fungi, green algae or algae included in the National Programme, genetic material of an actual or potential value, including products of contemporary biotechnological methods.

**Glacial lake** - glacier lake.

**Gradation (outbreak, plague)** - process leading to extreme increase in the population numbers within some species (insects, small mammals). For species characteristic by their regular population cycles, this is the peak phase.

**Greenhouse gases** - gases that are capable of absorbing a certain amount of thermal radiation in the atmosphere, particularly in lower levels. They cause changes in the radiation balance of the atmosphere due to the greenhouse effect (particularly water vapour, carbon dioxide, methane, nitrogen monoxide, ozone and halogenated carbohydrates - freons and halons).

**Guild** - mostly a group of species present in the same area, under specific environmental conditions, such as temperature or humidity (beta-guild), or a group of species that use the same resources, e.g. food (alpha-guild).

## H

**Habitats Directive** - Directive 92/43/EEC 1992 on the conservation of natural habitats and of wild fauna and flora. Its objective is to contribute to conservation of biodiversity through conservation of natural habitats and wild fauna and flora in the European territory of the EU Member States. The goal is to maintain and restore the favourable conservation status of habitats and species.

**Halophilic, psammophilic vegetation** - vegetation bound on saline soils and on sandy substrates.

**Horizontal precipitation** - liquid (fog, dew) or suspended (hoar frost, frost).

## I

**Important landscape feature** - as an environmentally, geomorphologically or aesthetically valuable part of the landscape, it forms its typical relief or contributes to maintaining its stability. Important landscape features include forests, peat bogs, water courses, fishponds, lakes and floodplain meadows. Furthermore, they also include parts of the landscape which are registered as an important landscape area, particularly wetlands, steppe grasslands, hedge rows, hedges, permanent grasslands, deposits of minerals and fossils, artificial and natural rock formations, outcrops and uncovered areas. They could also include valuable vegetation in urban agglomerations, including historical gardens and parks. Specially protected parts of nature are exempted from this definition (Act No. 114/1992 Coll.).

**In-situ/ ex-situ** - living in its natural environment/ outside its natural environment (e.g. ZOO, botanical garden).

**In-situ conditions** - conditions where genetic resources exist in the framework of ecosystems and natural habitats; in case of domesticated or cultivated species, in the environment where they developed their characteristic properties.

**Intergovernmental Panel on Climate Change (IPCC)** - independent scientific and expert body concerned with promotion of understanding of the nature of the climate change and evaluation of environmental, economic and social consequence, established in 1989.

**In vitro** - tissues maintained outside a living organism, in a test tube or some other artificial environment (e.g. cryoconserved seed doses, embryos).

**Information system** - a system providing the relevant information pursuant to the set rules, verification, validation, data quality assessment, quality control, etc. particularly for information technologies.

**Internalization of externalities** - inclusion of all costs that are related to the production and use of a certain type of energy and whose part otherwise pays by the society within prices of other products in the price of this energy.

**Invasive alien species** – non-indigenous species, whose introduction and/or expansion endangers biodiversity (CBD).

**Invasive plants** - geographically non-indigenous plants that have acclimatized in the given territory and, by their spontaneous spreading, cause deterioration of domestic ecosystems or direct economic damage.

**Inundation** - flooding of territory adjacent to a water course during floods.

**Irreversible** - an irreversible phenomenon which takes place in a single direction, rather than vice versa.

## K

**Kyoto Protocol** - Protocol signed on December 11, 1997 in Kyoto as part of the UN Framework Convention on Climate Change is the first legal document requiring that the individual developed countries of the world adopt their own obligations for overall reduction of greenhouse gases by the end 2012.

## L

**Limiting factors** - factors limiting the function of organisms by the effect of their minimum or maximum values. They are especially critical for the survival of organisms, and can limit their occurrence, activity, growth, reproduction, mortality, etc.

## M

**Management** - system of measures for specially protected parts of nature (specially protected species and Specially Protected Areas); in general, a system of direction.

**Mangrove** - tropical coastal complex of trees adapted for permanent or cyclic flooding, particularly by transitional or saline water.

**Metainformation system** - system associating „information on information“, see information system.

**Migration** - movement of animals, plants or parts thereof (seeds, fruit), always in a certain direction, affecting usually the entire population and, in certain cases, leading to expansion of a species. Migration can be regular with return (birds, fish, large herbivores) or without return. Migration is dependent particularly on food, reproduction and climate conditions. Organisms can also disperse passively with the assistance of air and water flow, humans or animals.

**Molecular phylogenesis** - modern approach to study of populations and species, their expansion and particularly history of expansion. This is a procedure which permits very accurate reconstruction of genetic differentiation and history of geographical distribution of a certain species or population. In practice, this information is absolutely essential for conservation of taxa or management thereof.

**Monumental tree** - pursuant to Act No. 114/1992 Coll., a tree of extraordinary importance is protected against damage, destruction and disturbance of its natural development.

**Mountain zone** - mountain vegetative zone with mixed spruce-fir-beech forest passing into mountain spruce stands (in the Czech Republic, usually 800-1,000 m a.s.l.).

## N

**National databank of natural forests** - survey of forests meeting the criteria defined according to the degree of direct anthropogenic effect.

**National inventory of forests** - assessing the state of the forest in the territory of the country on the basis of Regulation of the Government No. 193/2000 Coll.

**National park** - large territory that is unique on a national or international scale whose substantial part is covered by natural ecosystems or ecosystems that have been marginally modified by human activities, where plants, animals and non-living nature have extraordinary scientific and educational importance (Act No. 114/1992 Coll.).

**Natura 2000** - a system of protected areas established under the European Community legislation (Birds and Habitats Directives) by each EU Member State. A complex of protected areas that is important from the viewpoint of the EC.

**Natural habitat** - is a natural or semi-natural terrestrial or water body that is delimited on the basis of geographical characteristics and characteristics of living and non-living nature (Act No. 114/1992 Coll., ).

**Natural species composition (NSC)** - a complex of species of organisms that usually occur in the given unaffected type of a habitat.

**Nature Protection Act** - Act No. 114/1992 Coll., , on the Protection of Nature and the Landscape, as amended;

**Nature restoration** - a method of ecological renewal which ensures the return of a complex of plants and animals which were natural inhabitants of the given area prior to commencement of effects of the destructive factors. Restoration is a synonym.

**Non-indigenous species (alien species)** - species, subspecies or a lower taxon outside its previous or current original natural distribution area, including each part, gametes, seeds, eggs, or propagulates of such species that might survive and subsequently reproduce (CBD).

**NSC** - see natural species composition

**NUTS** - La Nomenclature des Unités Territoriales Statistiques – classification of territorial statistical units according to the EU. It is used for statistical monitoring and analyses of the socio-economic situation in regions and for the needs of preparation, implementation and evaluation of regional policies.

## O

**Opportunistic species** - species able to take advantage of opportunities, adapt to the current situation in external conditions; able to take advantage of a sudden source of food or other resources.

## P

**Parent area of wood species** - area with planted wood species of the required properties intended for withdrawal of chips for vegetative multiplication.

**Passport data** - basic information element containing descriptive data (attributes) processed on the basis of unambiguous rules with a clearly defined structure and properties. The passport allows for keeping detailed analytical records.

**Pathogenicity** - interaction of viruses, bacteria, protozoa and other pathoergonts (vectors of diseases) with animals and humans causing various contagious diseases of the infected individuals.

**Pathovar** - subspecies or strain of bacteria which infects only plants of a certain species or genus. *Source: FAO Glossary of Biotechnology for Food and Agriculture.*

**Photosynthesis** - process in which solar energy is received by green plants and transformed to energy of chemical bonds.



**Phytogeographical area** - unit of phytogeographical classification which emphasises the vegetation component in delimitation of landscape units.

**Physiotype** - group of vegetative types with an identical or very similar structure and function.

**Pollution levels** - depositions; solid, gaseous and liquid substances polluting the atmosphere falling on the Earth's surface.

**Predation** - a relationship between organisms where one organism (population) becomes a source of energy and nutrition for other organisms (populations).

**Primary energy sources** - natural energy sources established during the geological development of the Earth or by action of other natural processes (e.g. sun, wind, water, geothermal energy, tidal energy, etc.).

**Protected landscape area** - large area with a harmonic landscape, characteristic relief, substantial proportion of natural ecosystems of forest stands and permanent grasslands, containing a number of various wood species or with preserved monuments of historic settlements (Act No. 114/1992 Coll.).

**Protected territory/area** - means a geographically defined area which is designated or regulated and managed to achieve specific conservation objectives (CBD).

**Provenience** - geographical origin of seeds, wood species or tree stands.

**Provision of information to the public** - active dissemination of information to an unlimited group of entities without the need to submit a request. This includes, e.g. publication of reports on the state of the environment, environmental yearbooks, operation of websites including databases, maps, meta-information, updating official boards, etc.

Passive disclosure of information means the provision of requested information and sets thereof on the basis of requests lodged pursuant to Act No. 123/1998 Coll. and Act No. 106/1999 Coll.

On the international scale, provision of information to the public is regulated, e.g., by the UN ECE Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (the Aarhus Convention). In case of an emergency, the endangered public is warned pursuant to the special regulations. (Act No. 239/2000 Coll., on the Integrated Rescue System and on amendment to some laws, as amended by Act No. 320/2002 Coll., Act No. 240/2000 Coll., on Crisis Management and on amendment to some laws, (the Crisis Act) as amended by Act No. 320/2002 Coll., ).

## Q

**Quarry** - place for mining of a utility mineral or rock mined on the surface from deposits located on the surface or under ground. Quarries are classified according to the type of the mined mineral (coal, ore, other utility minerals and construction stone) and depending on its location under or above the surface (surface quarry, shelf quarry, pit quarry).

## R

**Refuge** - a site which, due to its conditions, allows for survival of one or more species.

**Reclamation** - a method of nature restoration where the original character of the habitat is ignored and a complex of any plants and animals that are capable of surviving in the given area at the given time are introduced.

**Regional economic integration organization** - means an organization constituted by sovereign States of a given region, to which its Member States have transferred competence in respect of matters governed by this Convention and which has been duly authorized, in accordance with its internal procedures, to sign, ratify, accept, approve or accede to it (CBD).

**Relation database** - spreadsheet database storing data in separate columns; each column contains data of a certain type. The database then consists of a set of various spreadsheets that are mutually interconnected.

**Renewable energy source** - renewable non-fossil natural energy sources, including wind energy, solar energy, geothermal energy, energy of water, energy of soil, energy of the air, and energy of the biomass.

**Residuum** – in landscape ecology, a residual burden on a habitat or locality after previous human activities (usually a deponium of toxic character with a long period of natural decomposition). In environmental chemistry - part of a chemical compound, usually alien and usually persistent in the environment for a long time (pesticide residues).

**Resilience** - ability of a system to return to the original state after a disturbance.

**Resistance** - ability of a system not to deviate from the relative balance in case of impairment of the current state until a limit is reached when the system collapses.

**Responses** - mutual interaction of two components of a system responding to action of one of these components. Responses include effects caused by an increase in effectiveness of a given feature (positive response) or its decrease (negative response) and are, in turn, partly affected by this feature.

**Restoration** - a method of ecological renewal where the return of at least part of the original set of plants and animals who were natural inhabitants of the given area prior to commencement of the destructive factors, mostly in case of fundamental or even irreversible changes in the abiotic conditions in the given locality. Rehabilitation is a synonym.

**Riparian vegetation** - riparian (littoral zone) vegetation of flowing and still waters.

**Ruderal vegetation** - weed vegetation growing on newly opened substrates, made-up grounds, landfills, etc., incl. mostly annual plants with high amount of small seeds, adapted for rapid dispersal. This vegetation is gradually replaced by persistent plants with great competitive ability, producing large biomass.

## S

**Semi-terrestrial ecosystem** - ecosystem on land and the transitional area between land and the aquatic environment.

**Site of European importance** - a site requiring special territorial protection and meeting the conditions pursuant to Section 45a (1) of Act No. 114/1992 Coll., which:

1. has been included in the list of sites located in the territory of the Czech Republic selected on the basis of the criteria stipulated by the legislation of the European Communities and requiring territorial protection (the "national list"), until their inclusion in the list of sites of European importance (the "European list");
2. meets the conditions for inclusion in the national list, but has not been included therein and contains a priority natural habitat or priority species, and whose inclusion in the European list is subject to negotiations with the European Commission until the Czech Republic reaches agreement with the Commission on inclusion or non-inclusion of the site or until a decision is made by the Council of the European Union ("disputable site"); or
3. has been included in the European list (Act No. 114/1992 Coll.).

**Specially protected part of nature** - very important or unique part of living or non-living nature; it can include part of the landscape, geological formation, tree, animal, plant and mineral, whose special protection has been declared by a governmental agency pursuant to Part Three or Four of the Act (Act No. 114/1992 Coll.).

**Species** - basic taxonomic category on the basis of which specimens that have an identical genotype and, therefore, the same body structure, metabolic processes, behaviour, food requirements, etc. are members of the same species. A more recent approach places emphasis on identical history of development of specimens of the same species.

**Species of Community interest (hereinafter "species of European importance")** - species in the European territory of the Member States of the European Communities that are endangered, vulnerable, rare or endemic and that are stipulated in the legislation of the European Communities; priority species of European importance are species that require special territorial protection and for whose conservation the European Communities bear special responsibility and that are stipulated in the legislation of the European Communities (Act No. 114/1992 Coll.).

**Species of European importance** - see species of Community interest.

**Smal-size SPAs** - national natural reserves, national natural monuments, natural reserves, natural monuments (see Act No. 114/1992 Coll.).

**Stakeholder** - an entity involved in biodiversity conservation; originally, a person with a certain stake in a company and, later, a person who is involved in decision-making or is concerned by decision-making (a public process).

**Sub-alpine zone** - vegetative mountain zone with mountain pine stands and unconnected spruce stands around the forest line (in the Czech Republic, mostly around 1,300 to 1,400 m a.s.l.).

**Subdominant species** - species which are not the most numerous in an ecosystem; nevertheless, they may play an important role in its functioning.

**Sub-halophillic** - property of a given type of an environment consisting in an increased content of salt ions (sodium, chlorides, sulphates) in soil or in water compared to normal conditions.

**Sub-humid area** - a general term for zones corresponding roughly to subtropics. In these areas, there is overall enough precipitation; however, in certain areas of the year, there is substantial deficiency of water.

**Sub-mountain zone** - the sub-mountain vegetative zone with prevailing beeches and fir-beech stands (in the Czech Republic, usually around 500-800 m a.s.l.).

**Sustainable development** - development of the human society which satisfies the needs of the present generation without endangering the needs of the future generation, and does not endanger the natural functions of ecosystems, decrease biodiversity, endanger the substance of natural resources and exceed the carrying capacity of the environment.

**Sustainable use** - the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations.

## T

**Taxon** - group of organisms that sufficiently varies from other similar groups that are arranged according to their composition. In zoology, e.g., the form, variety, subspecies, species, genus, family, order, class, phylum, kingdom)

**Taxonomy** - the theory and practice in description, designation and classification of organisms.

**Technology** - a set of procedures and activities for production, processing or modification of products. In CBD, the term includes not only hardware, such as the various apparatus or computer networks, but also diverse methods, skills and procedures (software), e.g., patents, methodologies for evaluation of the degree of endangerment of taxa or ecological (functional) groups, Geographical Information Systems (GIS), procedures of modern biosystematics or genetic analysis, or the management measures of protected species, habitats and areas. From the viewpoint of access to genetic resources and fair sharing of benefits following from their use, it is important that technology also includes biotechnology.

**Terrestrial species** - organisms growing or living on land or in air.

**Territorial System of Ecological Stability of the Landscape** - (TSES) is a mutually interconnected set of natural and modified, but semi-natural, ecosystems maintaining the natural balance. Territorial systems of ecological stability are classified as local, regional and supraregional systems (Act No. 114/1992 Coll.).

**Transgene** - an alien gene introduced to the DNA of an organism in order to obtain a certain phenotype change. Such change does not occur under normal (natural) conditions.

## U

**UN Framework Convention on Climate Change** - international multilateral convention signed in June 1992 in Rio de Janeiro, stipulating the basic obligations of the individual groups of countries with respect to the growing danger of global climate change.

## V

**Vertical precipitation** - liquid (rain, drizzle) or solid (snow, hail, ice needles).

## W

**Water deficiency** - long-term reduction of the volume of water reserves compared to the optimum in soil or in living organisms.

**Wild animal - (hereinafter "animal")** - a specimen of animal species that occurs in nature and is not directly managed by man. A specimen directly managed by man is considered to be a specimen of animal including bird species raised in captivity which carries a unique mark or is identified by a fixed ring or transcoder or some other unique manner or registered by a Nature Conservancy authority. On the basis of a written application of the holder, a Nature Conservancy authority is obliged to register such specimen within 30 days, unless it has a reasonable suspicion of illegal origin thereof (Act No. 114/1992 Coll.).

**Wild plant** - (hereinafter "plant") is an individual or colony of plant species, including fungi, whose populations survive spontaneously in nature. A plant includes all its underground and above-surface parts (Act No. 114/1992 Coll.).

**Wood species growing outside forests** - (hereinafter "wood species") is a tree or bush growing separately or in a group in an open landscape or in urban agglomerations on properties outside the forest land fund (Act No. 114/1992 Coll.).

**114/92 Coll.**, - Act on the Protection of Nature and the Landscape, as amended

**6. EAP** - 6th Community Environment Action Programme

**ABS** - Access and Benefit Sharing

**AECC** - Association of Environmental Consultancy Centres

**AEWA** - African-Eurasian Waterbird Agreement

**AGR** - Animal genetic resources

**ANCLP CR** - Agency for Nature Conservation and Landscape Protection of the Czech Republic

**AP CEPA** - Action Plan of Communication, Education and Public Awareness

**APRI** - Animal Production Research Institute

**AS CR** - Academy of Sciences of the Czech Republic

**CARP** - Concept of Agrarian Policy of the Czech Republic for the Period After Accession to EU (2004 – 2013)

**CSTP** - Concept of the State Tourism Policy for the 2002 – 2007 period

**CBD** - Convention on Biological Diversity

**CBD COP Decision VII/2** - second decision of the seventh Conference of the Parties of CBD

**CEE** - Centres of Environmental Education

**CEI** - Czech Environmental Inspectorate

**CEPA** - Communication, Education and Public Awareness

**CFC** - Chlorofluorocarbons

**CGRFA** - Commission on Genetic Resources For Food and Agriculture

**CHM** - Clearing House Mechanism

**CHMI** - Czech Hydrometeorological Institute

**CITES** - Convention on International Trade with Endangered Species of Wild Fauna and Flora

**CMS** - Convention on the Conservation of Migratory Species of Wild Animals

**COP** - Conference of the Parties of the CBD

**COP VII** - Seventh meeting of the Conference of the Parties

**COP Decision VII/2** - second decision of the seventh Conference of the Parties of CBD

**CPIS** - Centre for Public Information Services

**CR** - Czech Republic

**CSO** - United Nations Commission for Sustainable Development

**DADIS** - Domestic Animal Diversity Information System

**EC** - European Community, European Communities

**ECCO** - European Culture Collection Organisation

**EEA** - European Environment Agency

**EEC** - European Economic Community

**EECONET** - European Ecological Network (Pan-European Ecological Network, PEEN)

**EIA** - Environmental Impact Assessment  
**EIONET** - European Information and Observation Network  
**EU** - European Union

**FAO** - Food and Agriculture Organisation of the United Nations  
**FEC** - Forestry Economic Curriculum  
**FEP** - Forestry Economic plan  
**FGMRI** - Forestry and Game Management Research Institute

**GDP** - Gross Domestic Product  
**GEF** - Global Environmental Facility  
**GHG, GHGs** - Greenhouse gases  
**GMO** - Genetically modified organisms  
**GPA** - Global plan of actions  
**GR** - Genetic resources  
**GTI** - Global Taxonomy Initiative

**HRDP** - Horizontal Rural Development Plan

**IPCC** - UN International Panel for Climate Change  
**ITPGR** - International Technical Conference on Plant Genetic Resources  
**ITWGGR** - Working Group on Genetic Resources  
**IUCN** - The World Conservation Union

**JLG** - Joint Liaison Group (CBD, UNCCD, UNFCCC)

**MA** - Ministry of Agriculture  
**MCPFE** - Ministerial Conference for the Protection of Forests in Europe  
**MDG** - Millennium Development Goals  
**ME** - Ministry of Environment  
**MEYS** - Ministry of Education, Youth and Sports  
**MGR** - Micro-organism genetic resources  
**MIT** - Ministry of Industry and Trade  
**MLSA** - Ministry of Labour and Social Affairs  
**MRD** - Ministry for Regional Development  
**MT** - Ministry of Transport

**Natura 2000** - the European Community system of protected areas established under the Birds Directive and Habitats Directive by the European Union Member States  
**NCIS** - Nature Conservation Information System  
**NM** - Natural monument (pursuant to Act No. 114/92 Coll., )  
**NNM** - National natural monument (pursuant to Act No. 114/92 Coll., )  
**NNR** - National natural reserve (pursuant to Act No. 114/92 Coll., )  
**NO<sub>x</sub>** - Nitrogen oxides  
**NP** - National park  
**NR** - Natural reserve (pursuant to Act No. 114/92 Coll., )  
**NSC** - Natural species composition

**NUTS** - La Nomenclature des Unités Territoriales Statistiques

**OECD** - Organization for Economic Cooperation and Development

**PDC** - Pure dairy culture

**PEEN** - Pan-European Ecological Network

**PGR** - Plant genetic resources

**PGRFA** - Plant Genetic Resources for Food and Agriculture

**PLA** - Protected Landscape Area

**PPRI** - Plant Production Research Institute

**R&D** - Research & Development

**RES** - Renewable energy sources

**SBSTTA** - Subsidiary Body for Scientific, Technical and Technological Advice

**SEF CR** - State Environmental Fund of the Czech Republic

**SEP CR** - State Environmental Policy of the Czech Republic

**SNCLPP CR** - State Nature Conservation and Landscape Protection Programme of the Czech Republic

**SP CEPA** - State Programme of Communication, Education and Public Awareness

**SWPP** - Small water power plants

**TRIPS** - Trade-Related Aspects of Intellectual Property Rights

**TSES** - Territorial system of ecological stability

**UEIS** - Unified Environmental Information System

**UN** - United Nations

**UN ECE** - UN Economic Commission for Europe

**UNCCD** - United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa

**UNCED** - United Nations Conference on Environment and Development

**UNCLOS** - United Nations Convention on the Law of the Sea

**UNDP** - United Nations Development Programme

**UNEP** - United Nations Environmental Programme

**UNESCO** - United Nations Educational Scientific and Cultural Organisation

**UNFCCC** - United Nations Framework Convention on Climate Change

**UNFF** - United Nations Forum on Forests

**WCMC** - UNEP World Conservation Monitoring Centre

**WFCC** - World Federation for Culture Collection

**WIPP** - Wind power plants

**WSSD** - World Summit on Sustainable Development, Johannesburg, 1992

**WTO** - World Trade Organization

**WTO/OMT** - World Tourism Organisation

**WWF** - World Wildlife Fund





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