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# CHAPTER I

## OVERVIEW OF BIODIVERSITY STATUS, TRENDS AND THREATS

### 1. INTRODUCTION

#### 1.1. The Convention on Biological Diversity

##### *1.1.1. Some data concerning the convention and its objectives in Slovenia:*

The Convention on Biological Diversity (CBD) is one of the key international agreements in the field of nature conservation. The motive for its adoption in Rio de Janeiro in 1992 was a rapidly advancing decline in biodiversity due, to a great extent, to human activity. The convention, which links 193 parties (2010), provides a framework for work in the field of conservation and sustainable use of biodiversity, conservation of nature, and working together and managing biodiversity components at all levels.

Slovenia, which ascribes special importance to those convention provisions that are aimed at the conservation of nature and biosafety, ratified the convention through the Act Ratifying the Convention on Biological Diversity in 1996. In general terms, biodiversity has also been gaining importance as a result of a commitment to implement the convention provisions. In the 2003–2004 period, the chapter on nature conservation was subject to a thorough revision of regulations that provide for higher legal standards in this field. Since the European Union is a party to the convention, the transposition of EU regulations into the Slovenian legal order was accordingly followed by a simultaneous transposition of requirements, recommendations and directions facilitating better implementation of the convention by Slovenia. Recently, the field of biotechnology has undergone rapid development due to its economic importance. This, in turn, increased the need for biological safety. In 2000, the Cartagena Protocol on Biosafety was adopted for this purpose within the convention framework. The protocol's objective is to protect biodiversity against the potential threat of genetically modified organisms (GMOs) as a result of modern biotechnology. The protocol was ratified by Slovenia in 2002 (Ur.l. RS, No. 89/02). The report on the implementation of the protocol is available on the convention web site:

<http://www.cbd.int/biosafety/parties/reports.shtml?report=NR-CPB-01>.

### 2. OVERVIEW OF BIODIVERSITY IN SLOVENIA

#### 2.1. Status of biodiversity in Slovenia

##### *2.1.1. Geographical characteristics of Slovenia influencing biodiversity*

Slovenia (20,254 km<sup>2</sup>) is situated in the southern part of Central Europe where the Alps, the Pannonian plain, Dinaric mountain chain and the Mediterranean meet [24].

It has varied relief with an altitude span of 0 to 2,864 metres. Its geological structure is diverse, and includes 44% carbonate-based bedrock, while 16% of the territory is covered by quaternary sediments [24].

Most of Slovenia has a moderate continental climate. Its southwestern part has a mild Mediterranean climate, while severe Alpine and/or continental climate can be found in the high mountain ranges, in alpine valleys and on some high Dinaric plateaus [24].

Slovenia abounds with watercourses (26,600 km) and standing waters, which divide between the Black Sea (83.2%) and Adriatic Sea (16.8%) drainage systems. Underground water bodies are numerous but are unevenly distributed. The Slovenian sea (40 km<sup>2</sup>) with 47 km of coast is part of the relatively shallow Northern Adriatic, which rarely exceeds 30 m in depth [2].

In 2008, forests covered 58.5% of Slovenia's surface; 34.9% was agricultural land and 2.7% urban areas, while the remainder consisted of wetlands, waters and areas with no vegetation cover [1].

Its geographical position, diverse geological, orographic, soil, climate and hydrological features, and human actions have resulted in a high degree of ecosystem- and species-related diversity in Slovenia. Slovenia is a small country accounting for only 0.004 % of the total and for 0.014 % of the land surface of the Earth. However, it is a place where at least 1% of today's known species of organisms and at least 2% of all known continental species (continental and freshwater) can be found. So far, around 22,000 of plant and animal species have been identified and documented; estimations concerning the potential number of species range between 50,000 and 120,000 species [10] [22] [38].

### 2.1.2. Ecosystemic diversity

Climax vegetation on more than 90% of Slovenia's surface consists of forests. Human action has strongly influenced the appearance of the primary landscape. Forest clearance, use of soil for agricultural purposes, drainage of wetlands, urbanisation and other action resulted in the retreat of natural ecosystems at the expense of new (agricultural, in particular) ecosystems, bringing in new habitat types [10].

For the purposes of conservation and knowledge on ecosystemic diversity (including species-related and genetic diversity) in Slovenia, several projects have been carried out during the reporting period.

"Renaturation" and management of habitats in the Škocjanski zatok Nature Reserve following industrial degradation in the 80s were the principal objectives of the LIFE Project "Renaturation and conservation of habitats and birds in the Škocjanski zatok Nature Reserve".

More information about this project is available at: [www.skocjanski-zatok.org](http://www.skocjanski-zatok.org).

The purpose of the "Project 1001 Karst ponds – 1001 stories of life" was to maintain the network of water biotopes and, consequently, the conservation of the population of Italian Crested Newt (*Triturus cristatus*) and of Yellow-bellied Toad (*Bombina orientalis*) in the Natura 2000 area of the Karst, as well as in other areas of Western Slovenia. More information about the project is available at: <http://1001kal.kras-carso.com/?vsebina=prva>.

As part of cooperation between the Principality of Monaco and the Regional Centre for protected areas under the Barcelona Convention, protection and conservation efforts are carried out with a view to preserving the Neptune Grass (*Posidonia oceanica*) marine meadow located between the towns of Koper and Izola; in addition, a publication with descriptions of endangered species and habitat types in the Slovenian littoral was published. More information available at: [http://www.zrsvn.si/sl/informacija.asp?id\\_meta\\_type=63&id\\_informacija=623](http://www.zrsvn.si/sl/informacija.asp?id_meta_type=63&id_informacija=623).

### 2.1.3. Habitat type diversity

So far, 514 natural and anthropogenic habitat types have been identified and documented in Slovenia<sup>1</sup>. By 2008, around 15% of Slovenia's non-forest grown surfaces had been mapped [13] [28].

<sup>1</sup> The information is based on the Slovenian habitat types typology, having basis on palearctic classification (Physis) and organised hierarchically. Seven basic groups are divided into several levels (Jogan et al., 2004) in dependence of ecological characteristics and of characteristic species (Jogan et al., 2004). The number of habitat types given below is indicated pursuant to level 3 of the above mentioned typology.

The number of anthropogenic habitat types increased in the past at the expense of decline and fragmentation of natural habitats. Today, the process with regard to some agricultural land surfaces has reversed – agricultural land surfaces of little economic concern are being overgrown and transformed into wood habitats.

In the report on the status of conservation of species and habitat types under Article 17 of the Habitats Directive from 2007 (the report deals with the Directive’s featured habitat types only), conservation status has been assessed as most unfavourable for grassland, freshwater and bogs and marshes (Figure 1.1). These habitat types have been most threatened particularly for anthropogenic factors [6] [25].

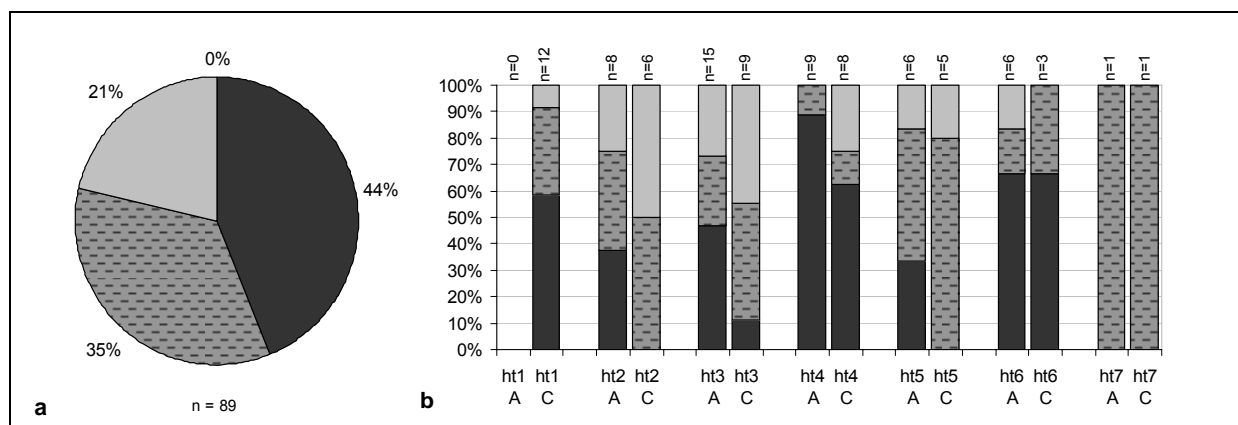


Figure 1.1: Final evaluation of conservation status of habitat types (HT) according to the report under Article 17 of Habitats Directive.

(■ Favourable status of conservation, ▒ insufficient status of conservation, □ poor status of conservation, □ status of conservation unknown; n=number of habitat types in a group; ht1 – HT coastal and marine, ht2 – Ht freshwater, ht3 – HT scrubs and grasslands, ht4 – HT forests, ht5 – HT bogs, fens and marshes, ht6 – HT barren land, ht7 – HT caves (HT groups transposed from the Regulation on Habitat Types (Official Journal of the RS, No 112/2003)); A – Alpine biogeographical region, C – continental biogeographical region)

The Biodiversity Conservation Strategy objective in Slovenia (2002) is: conservation of ecosystems through maintaining habitat types at a favourable status [21].

### 2.1.3.1. Landscape diversity

Slovenia is characterised by a diverse landscape structure that is relevant for its biodiversity and has a remarkable experiential value. Slovenia’s five basic regions comprise 357 listed landscape patterns; proposals have been made for 84 areas to be classified as outstanding landscapes [17].

The landscape structure and its biodiversity are crucially influenced by socioeconomic conditions, particularly in the field of agriculture. Agricultural activity affects the distribution of landscape components and their structure. Slovenia’s special feature is an articulated structure of small landscape units. However, due to changes in agricultural policy, this is increasingly being lost [17].

The landscape-conservation strategy has been devised as an integral part of Slovenia’s national spatial plan. Its fundamental objective is identification of the main instruments for maintenance and management of the cultural landscape to be included in the national spatial policy and spatial-plan components [23].

To preserve Slovenia's landscape diversity, the Biodiversity Conservation Strategy sets two objectives:

- Conservation of traditional extensive and sustainable type of use of land/space aimed at maintaining high level of biodiversity, landscape diversity and landscape cultural identity in parts of protected areas and in outstanding landscape areas;
- Conservation of the existing landscape diversity and of its natural and cultural value [21].

#### 2.1.4. Species diversity

By 2008, around 15,000 animal and 6,000 plant species, including 5,000 fungi species had been identified and documented. The number of bacteria and archaeobacteria is not known [3] [10] [22] [38].

More than 3% (over 850) of all registered species in Slovenia are endemic. The prevailing categories in animal species are insects (over 500), millipedes (*Myriapoda*) (89), crustaceans (*Crustacea*) (69) and molluscs (*Mollusca*) (55). Around 400 endemic species live in karstic subterranean caves. Among plants, 62 are endemic, of which 22 grow only in Slovenia [22].

Threatened species of vertebrates comprise 36% of mammals, 49% of birds, 73% of amphibians and 48% of fish and hagfish. Threat evaluation for non-vertebrates is not available due to insufficient research of this category. In addition, around 10% of vascular plants are subject to threat [22] [26].

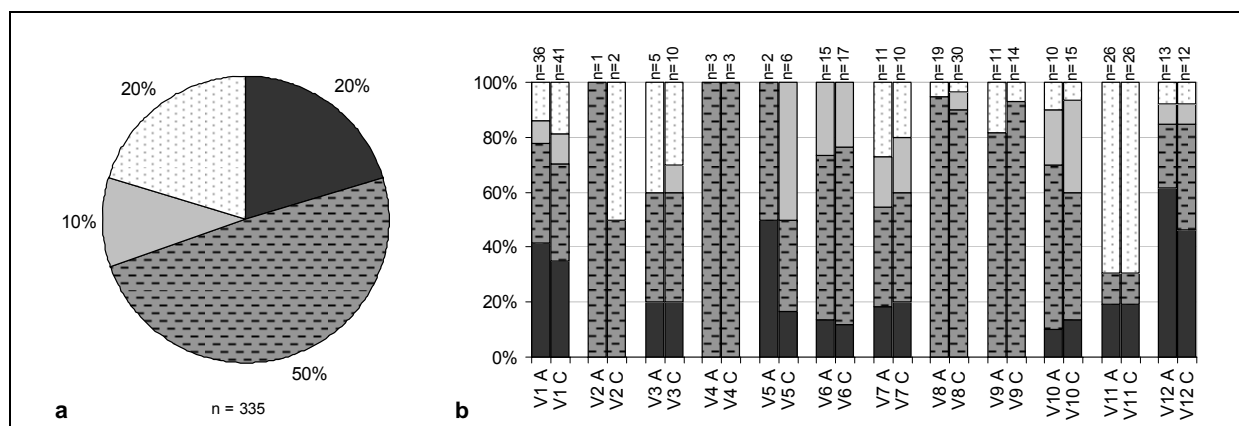


Figure 1.2: Final evaluation of conservation status for species (V) according to the report under Article 17 of Habitats Directive.

(■ Favourable status of conservation, ■ insufficient status of conservation, ■ poor status of conservation, □ status of conservation unknown; n=number of species in a group; V1 – plants, V2 – leeches, V3 – molluscs, V4 – crustaceans, V5 – dragonflies, V6 – butterflies, V7 – beetles, V8 – fish and hagfish, V9 – amphibians, V10 – reptiles, V11 – bats, V12 – mammals excl. bats; A – Alpine biogeographical region, C – continental biogeographical region)

The Biodiversity Conservation Strategy objective in Slovenia is to maintain all indigenous animal and plant species at favourable status [21].

During the last reporting period, several projects were launched and/or finished in Slovenia that contributed to knowledge on diversity of species. Most were targeted at the Natura 2000 areas and species.

A research and development project entitled "A list of macromycete species and their spread in Slovenia" was concluded. Among other things, the project resulted in the preparation of a list of Slovenia's fungi, establishment of a system for collecting



data on fungi and a new proposal concerning the red list. More information about the project is available at: <http://www.gozdis.si/departments/forestprotection/boletus/arealnearte/slo/bi.htm>.

In addition, several projects supported by the Phare and Interreg grant schemes were carried out. One objective was conservation of biodiversity, including genetic resources. Among other things, these projects included establishment of an inventory of species and mapping of habitat types, giving priority to Natura 2000 areas. Some projects included proposals for monitoring the situation and the starting points for drawing up management plans.

More information about these projects is available at:

[http://www.mop.gov.si/si/delovna\\_podrocja/direktorat\\_za\\_okolje/sektor\\_za\\_zavarovana\\_obmocja/phare/](http://www.mop.gov.si/si/delovna_podrocja/direktorat_za_okolje/sektor_za_zavarovana_obmocja/phare/)

One of the objectives of the Interreg IIIA project "Cross-border cooperation on management, conservation and research of the Dinaric lynx population (DinaRis)" was the drafting of a proposal on a management strategy for the population of Dinaric lynx and its monitoring. More information about this project is available at: [http://www.dinaris.org/Glavna\\_stran](http://www.dinaris.org/Glavna_stran).

The purpose of the LIFE project "Establishment of a long-term protection for the Corncrake (*Crex crex*) in Slovenia" was to put in place mechanisms for efficient protection and long-term conservation of this bird in Slovenia. More information about this project is available at: [www.life-kosec.org](http://www.life-kosec.org).

In addition, several species were listed and habitat types mapped within the LIFE project "NATURA 2000 in Slovenia – management models and information system". More information about this project is available at: [www.zrsvn.si/life](http://www.zrsvn.si/life).

### 2.1.5. Genetic diversity

Conservation of genetic diversity is considered an integral part of biodiversity conservation **2**. Maintaining and putting in place ecological corridors can prevent isolation of particular populations and the depletion of genetic diversity that is likely to lead to extinction of species. In certain cases, processes leading to a decrease in genetic diversity can be established by monitoring genetic variability even before they can be perceived through monitoring other characteristics [10].

Genetic diversity of wild flora and fauna species is very poorly researched; much better data are available on domestic animal breeds and plant species. Endemic species also certainly contribute much to Slovenian and European genetic diversity.

More data and work is available regarding genetic diversity of some fungi (e. g. *Hydnum*, *Tuber* and some other genera of ectomycorhizal species [43] [44] [45].

Recently, a number of projects contributing to knowledge on and conservation of genetic diversity of certain species have been carried out in Slovenia.

The project "Protective genetics of bear, lynx and reindeer in Slovenia" among other things presented an estimate of the number of bears living in Slovenia based on genetic research of excrement. A more detailed report on the subject is available at:

[http://www.arso.gov.si/narava/%C5%BEivalske%20vrste/ogro%C5%BEene%20in%20zavarovane/genetika\\_medved\\_ris\\_2004\\_07.pdf](http://www.arso.gov.si/narava/%C5%BEivalske%20vrste/ogro%C5%BEene%20in%20zavarovane/genetika_medved_ris_2004_07.pdf)

[http://www.arso.gov.si/narava/%C5%BEivalske%20vrste/ogro%C5%BEene%20in%20zavarovane/genetika\\_medved\\_ris\\_2004\\_07.pdf](http://www.arso.gov.si/narava/%C5%BEivalske%20vrste/ogro%C5%BEene%20in%20zavarovane/genetika_medved_ris_2004_07.pdf)

Similarly, the LIFE project "Maintaining the population of otter (*Lutra lutra*) in Goričko" determined the size of the otter population in Goričko through genetic research. More information about the project is available at: <http://www.freeweb.si/12darko>.

The objectives of the Biodiversity Conservation Strategy in Slovenia (2002) relating to conservation of genetic diversity are the following:

- Prevention of population fragmentation and linking together previously linked populations with a view to preserving circulation of genes; *in-situ* conservation of naturally isolated populations and/or their increase, where necessary;
- Provision of *ex-situ* protection of indigenous flora and fauna in places where populations are too small for successful *in-situ* protection [21].

<sup>2</sup> The notion of genetic diversity in this report applies particularly to that part of genetic diversity dealt with at the level of populations, that is within species. Genetic diversity is considerably preserved through the conservation of diversity in terms of species and ecosystems.

## **2.2. Main threats and trends to biodiversity**

The main threats to biodiversity are linked to human activity and its effect on space, which results in loss, fragmentation and degradation of ecosystems and habitats in terms of both species and populations. Most critical, in particular, are the pressures caused by urbanisation and non-sustainable development on wetlands ecosystems, inland waters, coastal and marine ecosystems, subterranean ecosystems and on extensively cultivated cultural-landscape ecosystems.

In addition, global changes, in particular, the spread of invasive species, new diseases and climate change have begun to show an impact on biodiversity in some of Slovenia's ecosystems.

More detailed description of individual threats is given in the continuation of this chapter (subchapter 3).

## **3. BIODIVERSITY STATUS, TRENDS AND THREATS IN MAJOR ECOSYSTEM TYPES**

### **3.1. Agricultural ecosystems**

The Biodiversity Conservation Strategy in Slovenia relating to agricultural landscape habitat types has two objectives:

- Conservation of wet and dry grasslands and meadow orchards with areas inhabited by threatened or endemic animal and/or plant species prioritised;
- Conservation and/or extension of the length of hedges with ecologically relevant areas prioritised [21].

#### *3.1.1. Status and trends*

Around 35% of Slovenia's territory is covered by agricultural land, of which 72% is situated in less favoured areas with regard to agricultural activity (hilly, mountain and karstic areas). These areas are of utmost importance for the conservation of biodiversity in agricultural landscapes. In 2007, of the agricultural land in use, the major part was meadows and pastures (56.5%). Fields accounted for 28%, and orchards and vineyards for 6%, while 3% of agricultural land was in the process of being overgrown. In the five-year period from 2002 to 2007, the share of meadows increased by 6.9%, of olive plantations by 41.7% and of extensively cultivated orchards by 2.2%. Fields and garden surfaces decreased by 15%, hop gardens by 16.3% and vineyards by 12.4%. Land covered by urban areas increased by 0.5% [1].

Agricultural-landscape ecosystems are the result of human activities. Their rich diversity in species and habitat types is the result of traditional use of agricultural land. Some areas in Slovenia retain relatively well preserved extensively cultivated agricultural habitat types (and related species) whose survival in Europe has become very threatened [10].

In the 2003–2007 period, inclusion of agricultural land in Natura 2000 agricultural and environmental programmes in areas with an emphasis on sustainable use grew from 7,000 ha to 55,000 ha. The biodiversity-relevant conservation status of agricultural landscape

ecosystems is expected to be maintained or even improved. Slovenia aims to include over 160,000 ha of agricultural land into these programmes by 2013.

#### 3.1.1.1. Grasslands

Among the habitat types of greatest importance for conservation of biodiversity in agricultural-landscape ecosystems are grassland habitat types. Natural grasslands in Slovenia are limited to areas above the upper tree line and some marshy areas. In agricultural landscape, grasslands originated and have consequently been preserved mostly through human activity.

A comprehensive survey of grassland habitat types for Slovenia has not yet been carried out. Vegetation grassland types have been examined botanically. However, their spatial distribution is known for only 15% of Slovenia's territory. Mapping of non-forest habitat types was carried out mainly for the Natura 2000 European ecological network [10]. By 2008, around 3,000 km<sup>2</sup> had been mapped; this surface increases every year by additional tens of square kilometres depending on funds available.

Grassland habitats, which originated through traditional use of agricultural land and are rich in species, continue to disappear for two reasons. In lowlands, the main reason is intensive agricultural production, which by altering the use of land (from meadows and pastures to fields or urban areas), homogenisation of cultivated surfaces, growing application of fertilisers and pesticides depletes diversity in terms of species and landscape. The second reason is the abandonment of traditional agricultural activities in areas of little economic concern (above all, hilly, mountain and karstic areas). With this abandonment of cultivation, grassland habitats are slowly overgrown and transformed via scrubland into forests [10] [20].

In Slovenia, 20 grassland habitat types have been identified and documented. Based on the Habitat Types Regulation, priority treatment aimed at maintaining favourable status was given to 13 habitat types [13] [28]. In 2007, the status of conservation of 7 grassland habitat types of agricultural landscape protected under the Habitats Directive was assessed. None of the habitat types under consideration was assessed positively in terms of conservation status. Due to pressures from intensive farming and urbanisation, the surface cover of lowland dry and wet extensively cultivated grassland habitat types is on the decline; for this reason, the conservation status of these habitat types was assessed as unfavourable. A better evaluation result was given to highland grassland habitat types, whose surface cover is in decline primarily for reasons of becoming overgrown [6] [25].

Data on the concrete number of species linked to grassland habitat types are not available. In some areas, more detailed research was carried out for some (primarily endangered) groups of animals and plants (flowering plants, birds, butterflies) [10]. These research activities have been undertaken in accordance with the financial resources of the Ministry of the Environment and Spatial Planning. In 2007, terrain monitoring of the status of birds in agricultural landscape was started for determination of the "FBI" (Farmland Bird Index, agricultural landscape index of birds) [11].

The unfavourable conservation status of grassland habitat types is also reflected in the conservation status of individual populations of species. Among the most endangered species are those connected with extensively cultivated wet and/or dry meadows. In 2008, due to inappropriate land use, an unfavourable conservation status indicated in the report under Birds Directive was established for 13 bird species. Most problems are due to intensive agriculture, in particular, early mowing of meadows, excessive fertilisation and the reduction of the land cover of meadows and wetlands resulting in a decrease in the extent and quality of relevant habitats. This is reflected in the declining population trends of Corncrake (*Crex*

*crex*), Eurasian Curlew (*Numenius arquata*), Whinchat (*Saxicola rubetra*) and Lapwing (*Vanellus vanellus*). An additional negative impact in connection with Scops Owl (*Otus scops*), Lesser Grey Shrike (*Lanius minor*) and Barred Warbler (*Sylvia nisoria*) can be seen in the depletion (disappearance of hedges and shrubs) of the mosaic cultural landscape and the disappearance of meadow orchards. European Roller (*Coracias garullus*) and Lesser Kestrel (*Falco naumanni*) are considered extinct species. Problems also arise in connection with overgrowing and abandonment of dry meadows resulting in the shrinking of habitats for Red Crossbill (*Loxia curvirostra*), Tawny Pipit (*Anthus campestris*) and Ortolan Bunting (*Emberiza hortulana*) [11].

Due to intensive cultivation and/or abandonment of agricultural land use on extensively cultivated wet and dry grasslands, several species of butterflies have come under threat. In 2007, conservation status of populations was assessed as poor for the *Maculinea* genus butterflies, Marsh Fritillary (*Euphydryas aurinia*) and Danube Clouded Yellow (*Colias myrmidone*). Similar observations apply to several plant species such as Meadow Gladiolus, Meadow Squill (*Scilla litardierei*), Greater Pasque Flower (*Pulsatilla grandis*), Serratula Lycopifolia and some orchids (*Orchidaceae*) species [6] [10] [25], as well as fungi (*Hygrocybe*, *Entoloma*) [41].

#### 3.1.1.2. Scrubland

In Slovenia, larger areas of scrubland as the climax vegetation can be found above the tree line and in some riparian areas. In agricultural landscapes, scrub is a transition stage in the development from grasslands to forests. For this reason, their surface coverage is subject to incessant change. However, the trend is towards an increase. In Slovenia, six types of scrub habitat have been identified and documented. Data concerning the distribution of particular scrub habitat types on the territory of Slovenia have not been collected [10].

#### 3.1.1.3. Orchards and fields

The importance of orchard and field habitat types is largely in conservation of landscape diversity. Due to the abandonment of traditional farming, the surface covered by extensively cultivated meadow orchards has decreased. In 2003–2007, surfaces included in the agricultural and environmental programme "conservation of meadow orchards" increased by 78% (100 ha). The increase in the surface covered by meadow orchards is expected to improve diversity in fruit types and facilitate the conservation of old varieties of fruit trees. By 2013, the share of orchards included in the mentioned programme is expected to rise by 10 times and this is expected to reduce the downward trend with regard to loss of surface coverage. Another consequence of intensive farming is the disappearance of traditional weeds in cereal species [1] [10] [20] [33].

#### 3.1.1.4. Urban habitat types

Urban habitats were created along with the development of infrastructure and urbanisation. The diversity of such habitat types can be very rich. However, besides autochthonous species, this richness is very often characterised by non-indigenous species introduced by people. In addition, urban areas contain habitats of several endangered species (bats, birds) [10].

### 3.1.2. Threats

Biodiversity and agricultural-landscape diversity are threatened in Slovenia firstly by local human action expressed through intensive farming and/or abandonment of land use. To a

lesser degree, this diversity is subject to climate change. In particular, in connection with extreme weather conditions [10] [21].

The most relevant threats to agricultural landscape ecosystems in Slovenia, and their biological and landscape diversity, are related to the following factors:

#### *3.1.2.1. Socioeconomic factors in agriculture*

Socioeconomic factors constitute the driving force of development in agriculture. Smaller agricultural holdings, with their traditional agricultural land use, are not competitive in the market economy; this has resulted in two characteristic features of Slovenian agriculture.

#### *3.1.2.2. Intensive agricultural production*

Rationalisation of agricultural production along with European Union and national grants can lead to a combination of agricultural land use with monocultural production of specific cultivars and more intensive agricultural production (increased application of pesticides, fertilisers, agricultural machinery). Reclamation of land and application of fertilisers on meadows alters and depletes their species composition. This in turn reduces biological diversity to a high degree and produces a negative impact on landscape diversity. Another threat to biodiversity posed by more intensive cultivation of meadows is transformation of meadows and pastures into fields. This results in the disappearance of numerous species including birds (Corncrake), butterflies and other species, particularly in lowland areas. Land use in the period 2005–2008 has shown a decrease in the surface covered by fields of approx. 15,000 ha and an increase in the surface covered by meadows by approx. 28,000 ha. However, these changes are the result of abandonment of land cultivation in areas with less favourable conditions for farming [10] [21] [27].

#### *3.1.2.3. Abandonment of agricultural land use*

At the same time, hilly, karstic and mountain areas of little economic use for agricultural production are becoming empty. Young people leave these areas in search of better social and economic conditions, so the active population is on the decrease, traditional agricultural activity is being abandoned and agricultural areas are becoming overgrown. In 2008, overgrown areas (21,600 ha) accounted for 1.06% of Slovenia's territory. Due to overgrowing, grassland habitat types are replaced by scrub and forests habitat types; biodiversity changes and diminishes, and the landscape loses its variety and becomes more monotonous [10] [21] [27].

#### *3.1.2.4. Activities affecting physical space*

Construction of settlements and of infrastructure is often planned in areas which are unattractive for agriculture, but which have high levels of biodiversity. In future, more pressure is expected from construction of holiday and tourist facilities and related recreational infrastructure in traditionally agricultural areas, which are becoming abandoned by the local inhabitants. Moreover, new settlements are expected to be extended on agriculturally less attractive wet lowland areas. An ever-increasing need for space and the resulting land prices lead to pressure on green spaces outside urban areas [10] [21].

#### *3.1.2.5. Changes to water regimes*

Regulation of watercourses, and reclamation and merging of land, which is frequently connected with intensive land use, threaten biodiversity of grassland habitat types. Changes to water regimes result in changes in vegetation and habitat type and, consequently, affect the type structure of meadows.

Moreover, riparian scrub vegetation is threatened by regulation and maintenance activities on relevant watercourses; in water margins, hedges and related species are fast disappearing [10] [27] [21].

#### *3.1.2.6. Invasive species*

Invasive species in agricultural-landscape ecosystems have not yet been subject to thorough research, since Slovenia began to deal with them only recently. The incidence of invasive species has increased significantly and this trend is expected to continue in the future. Certain agricultural-landscape habitat types (gardens, parks, fields) are the source of numerous invasive species (plants, in particular) which later spread to other ecosystems [10] [14] [21]. Increasingly frequently, species (44 identified and documented to date) that first took root in waste ground are spreading to fields and other ecosystems [39].

#### *3.1.2.7. Climate change*

The impact of direct climate change on the biodiversity of agricultural-landscape ecosystems in Slovenia is not yet known. However, there are clear indications a warming climate, for instance phenological springs, more turbulent weather conditions and longer drought periods. In the long term, these phenomena will cause changes relating to agricultural-landscape biodiversity.

Rather than solely giving rise to changes in average temperature and quantity of precipitation, climate change is believed to affect the existence of more turbulent weather conditions. This is likely to increase the existing risks to forest ecosystems, such as damage caused by wind and storms, summer droughts and excessive reproduction of particular groups of insects [10] [21].

### **3.2. Forest ecosystems**

The Biodiversity Conservation Strategy in Slovenia (2002) sets the following objective related to forest habitats:

- Maintenance of the conservation status of all forests habitat types at favourable level and an increase in areas with this status [21].

#### *3.2.1. Status and trends*

Slovenia is among Europe's most forested countries. Forests cover 1,185,145 ha ( 58.5%) of Slovenia's territory (as of 2008). The major part of Slovenian forests comprises beech, spruce-beech and beech-oak habitats (70%) with a relatively well-preserved composition of species. The forest growing stock is 300 cubic metres per hectare, while the annual increment amounts to 7.4 cubic metres per hectare [30].

Forestry, along with agriculture, is the principal form of spatial use that affects biodiversity. It has a very significant role in preserving natural habitats, as well as genetic biodiversity and species biodiversity.

Slovenian forest management is:

- Sustainable (sustainable conservation of forests and sustainable exploitation of forest assets and non-material functions);

- Close to nature (use of forests to an extent and in such a manner to facilitate conservation of all natural components of the forest);
- Multi-purpose (with equal significance for ecological, productive and social forest roles) [30].

Planned and long-term management of forests preserves and creates links between ecological, social and productive functions of forests. Due to their ecological and social functions, privately owned forests also constitute a public interest; for this reason, the state provides funds for the public forestry service and co-finances nursery and maintenance activities (40%), as well as maintenance of forest roads in privately owned forests also, thus helping the owners to achieve appropriate management [10] [30].

As much as 87% of Slovenia's forests have preserved their natural components. The prevailing type is mixed forest containing around 70 autochthonous varieties of trees. The prevailing tree types are beech and fir; spruce, due to a rejuvenation problem, has been subject to a considerable decline. In management, considerable attention has been devoted to less common tree species such as European Yew (*Taxus baccata*), Service Tree (*Sorbus domestica* and *Sorbus torminalis*) and Elm (*Ulmus glabra*). About 9% of forests have been subject to considerably changed and 4% of them to totally changed composition of tree species. This is due, in particular, to past afforestation with fir [10] [30].

In Slovenia, 19 forest habitat types have been identified and documented. With a view to maintaining favourable conservation status, priority treatment has been given to 15 [13] [28]. In 2007, the conservation status (with assessment given only for habitat types subject to protection under the Habitats Directive) of two habitat types (Natura code 9340, 91F0) was assessed as unfavourable and for one habitat type (91E0) as insufficient. Conservation status of the remaining 9 forest habitat types was assessed as favourable. The surface areas of the major part of the forest habitat types are either growing or remaining stable. Most threatened seem to be those that are fragmented in small area, such as oak-ash-elm groves situated along large rivers; this, however, is connected with the poor status of the running watercourses in these areas [6] [25].

Ecosystem diversity and conservation of forests constitute the basis for a high degree of species diversity. A total of 950 forest plant species (*Tracheophyta*, *Gymnospermae* and *Angiospermae*) have been identified, of which 47 are threatened. Other groups subject to more detailed examination were mammals (70 species, 25 threatened), birds (95 species, 46 threatened), reptiles (10 species, 10 threatened), amphibians (17 species, 11 threatened), butterflies, spiders, chilopods and earthworms. Other groups are not well known. It is thought that some 25,000 to 30,000 animal species live in the forests of Slovenia [10] [22]. Large complexes of closed forests provide habitat to large carnivores. In 2007, the populations of brown bear, wolf and jackal had a favourable conservation status, while that of lynx was assessed as poor, and threatened in the long term. The conservation status of the wildcat was also assessed as insufficient [6] [10] [25].

Among forest bird species, there are urgent problems with regard to Hazel Grouse (*Bonasa bonasia*), Wood Grouse (*Tetrao urogallus*), Black Grouse (*Tetrao tetrix*), Three-toed Woodpecker (*Picoides trydactylos*) and White-backed Woodpecker (*Dendrocopos leucotos*). The status of these populations is unfavourable and in decline. The decline in populations of wildfowl is the result of overgrowing of previously mown grasslands, mountain pastures, forest edges, degradation of specific habitats and of disturbances caused by mass tourism and leisure activities. A decline in the populations of Three-toed Woodpecker (*Picoides trydactylos*) and White-backed Woodpecker (*Dendrocopos leucotos*) is the result of a reduction in habitat rich in decaying wood mass. Recently, the Slovenian Forest Service has tried to curb the fall in these populations by introducing eco-cells and forest reserves [11] [30].

In 2007, the status of some populations of butterflies linked to forest sites, such as Wood White Butterfly (*Leptidea sinapis*), Scarce Fritillary (*Euphydryas maturna*) and Compton Tortoiseshell (*Nymphalis vaualbum*), was assessed as insufficient; these butterflies are threatened by the removal of vegetation on forest edges and by afforestation with conifers. Among species protected under the Habitats Directive, a favourable status assessment was given for Jersey Tiger Moth (*Callimorpha quadripunctaria*) populations [6] [25].

Due to insufficient knowledge on the distribution and ecological requirements of the majority of forest species, their population status is not known. However, in view of the generally favourable status of forest habitats, our conclusion may be that the majority of forest populations are not threatened.

Following different climate change models there are different projections of the distribution of tree species. Basic requirement for the long term conservation of forests is securing the adaptation potential of particular species through the conservation of genetic variability in well established, monitored and managed network of genetic forest reserves.

### 3.2.2. Threats

In future, the biodiversity of Slovenia's forests could become threatened by climate change, as well as by human action. Climate change constitutes the most important global change altering the basic vegetation composition. Human activity produces negative impacts on forest biodiversity through fragmentation, which affects above all the specialised forest species.

Major threats to forest ecosystems and their biodiversity in Slovenia include the following:

#### 3.2.2.1. Natural disasters, diseases, overpopulation of insects

In recent years, besides natural disasters (damage caused by snow, wind, sleet) Slovenia's forests have been threatened primarily by overpopulation of certain insects (in particular, bark beetles), which are the main reason of sanitary cuts (54.7% of sanitary cuts). On average, sanitary cuts account for a third of overall forest cuts. This situation affects the share of necessary tending cuts and, consequently, planned forest management, and weakens the ecological stability of forests [10] [30].

#### 3.2.2.2. Forest fires

Forest fires caused by train traffic and visitors, particularly in Western Slovenia's karstic region, constitute an important threat factor and have impact on forest biodiversity. In recent years, due to improved technical possibilities in information and rapid response, the total surface area damaged by fire fell [10] [30].

#### 3.2.2.3. Herbivorous game and grazing of cattle and small ruminants in forests

Overabundant deer and reindeer gnaw the bark from young trees; in some places, this makes it difficult or even prevents natural regeneration of forests. Moreover, due to the varying degrees of bark removed in particular tree species, this may result in changes to the natural composition of the forest. In this context, the most threatened species is the high Karst spruce.

In accordance with the Forests Act, it is forbidden to graze cattle and small ruminants in forests, since these, like game, affect the regeneration of forests. The problem of domestic



animals grazing in forests is limited to smaller areas of the Julian Alps and the Kamnik and Savinja Alps [10] [30].

#### *3.2.2.4. Deforestation and fragmentation of forests and inappropriate activities in forests*

Despite the fact that the forest cover of Slovenia has been increasing since the mid-19<sup>th</sup> century, there is considerable pressure on forests in some predominantly agricultural areas and on the edge of urban areas. Deforestation, in particular, in pursuit of local and personal interests weakens forests' ecological and social function and reduces their biodiversity. It results in disappearance of groups of trees, hedges, and riparian tree and scrub vegetation. The main driving force behind deforestation of this kind – particularly in lowland areas – is the need for new agricultural and urban areas and an inadequate agricultural grants policy.

Along with the deforestation process itself, negative impact on biodiversity is produced by inappropriate working methods and time of working activities in forests. In Slovenia, use of heavy machinery, which is likely to lead to erosion and compaction of soil, has increased as forests are machine cut. Equally problematic is tree felling in periods when animals are particularly sensitive to disturbances [10] [30].

#### *3.2.2.5. Removal of old and rotten trees*

Damaged and dead trees are soon removed from forests, particularly after natural disasters, to at least partially save their market value or to prevent harmful action by some of the problem insects. In some cases, when selecting trees for felling, older trees are still being selected. Although their market value may be low, their ecological value is considerable and important. In future, demand for damaged or decaying wood biomass is likely to grow on the grounds of its use as a renewable energy source. Excessive reduction of decaying and old trees in forests can be a threat to cavity-nesting birds, bats and numerous non-vertebrate species, fungi and plants [10] [30].

#### *3.2.2.6. Changing the water regime of forest sites*

Drainage (hydrological improvements), inadequate regulation of watercourses and excessive exploitation of water for energy purposes are a threat, in particular, to flood-plain forests. Changes in water regimes have impact on changes in vegetation and on the biodiversity of these forests.

#### *3.2.2.7. Activities affecting physical space*

Construction of industrial zones and expansion of settlements frequently reaches as far as forest areas, including the most naturally preserved ones. Forest space is very often burdened with illegal activities, such as sand pits and quarries. These have a strong impact on the forest landscape and a direct and indirect impact on the fauna.

In addition, inadequately planned forest roads can have an adverse effect on forest biodiversity. The construction of roads on steep terrain is likely to cause additional erosion of grounds. However, the probability of inappropriately constructed roads in Slovenia is not high, since all working activities in forests are carried out under the supervision of the Slovenian Forest Service. Moreover, forest roads facilitate access to remote forest parts but create disturbance in the forests, which together with forest fruit picking has an adverse effect on several birds and higher mammal species [10].

#### 3.2.2.8. Pollution of air and soil

In Slovenia, pollution of air is diminishing and is locally limited to the surroundings of big industrial centres. However, harmful sulphur and nitrogen oxides and ozone with an adverse effect on the health of Slovenia's forests are still found in the atmosphere. Forests situated on the fringes of agricultural landscapes are burdened with pesticides and excessive application of nutrients on agricultural land. Stricter environmental and agricultural legislation is expected to reduce the impact of industrial and agricultural pollution on forests [10].

#### 3.2.2.9. Invasive species

At present, invasive species in Slovenia's forests do not constitute a major problem. In this respect, it is worth mentioning Black Locust (*Robinia pseudoacacia*), which in some parts of the Prekmurje and Primorska regions took root in pure composition. Through successful spreading of its seeds, quick growth and stump-based regeneration it became a pernicious species threatening the autochthonous forest species composition. With climate change and with intended or unintentional introduction of non-indigenous species, the impact of invasive species on forest ecosystems is likely to increase [10] [14] [30].

#### 3.2.2.10. Climate change

The impact of climate change on Slovenia's forests is indirect. Rather than giving rise to changes in average temperature and quantity of precipitation, which affect the vitality of tree species at the edge of their areas of distribution, climate change is considered to produce an impact by provoking more turbulent weather conditions. This impact is likely to increase the already existing risks for forest ecosystems, above all damage caused by wind and storms, summer droughts and excessive reproduction of particular groups of insects. Over recent years, a link between summer droughts and forest fires, and the excessive reproduction of certain groups of insects was established. Climate change, in connection with global trade, contributes to the risk of introducing some non-indigenous species of fungi and insects. Recently, species such as Asian Longhorned Beetle (*Anoplophora glabripennis*), Citrus Longhorned Beetle (*Anoplophora chinensis*) and Chestnut Gall Wasp (*Dryocosmus kuriphilus Yasumatsu*) have appeared in Slovenia [10] [30].

### 3.3. Inland water and wetland ecosystems

The Strategy of Biodiversity Conservation in Slovenia sets the following objectives in relation to inland waters, bogs, fens and marshes habitat types:

- Conservation of the existing ecologically important wetlands and their habitat types at a favourable status and restoration of the ecological characteristics of degraded inland waters, bogs and marshes, where feasible;
- Comprehensive examination of waters in terms of a system in which surface and subterranean waters and their habitat types form an integral whole;
- Attainment of water quality standards such that exceptionally diverse, with regard to biotic characteristics, and well-preserved habitat types and habitats of endangered and endemic plant and animal species are not threatened, in particular by reducing industrial, agricultural and urban pollution of water;
- Prevention of introduction of non-indigenous species into the inland waters and of spreading of already introduced non-indigenous species to ecologically important areas;
- Encouragement of land use on river banks and in alluvial river areas that conserves habitat types that maintain the water cycle, and are important for conservation of biodiversity and the reduction and prevention of damage caused by waters;

- Adjustment of land use to natural water regimes and concentration of activities outside areas of intensive hydrodynamic processes and areas of strategically important water resources [21].

### 3.3.1. Status and trends

Slovenia, in terms of quantity of water running on and below its surface is a water-abundant country; consequently, its surface waters in regard to their geographical, hydrological, hydro-chemical and hydro-biological characteristics can be qualified as diverse. Inland waters cover around 0.58% of Slovenia's territory, i.e. 120 km<sup>2</sup> of water surfaces, of which 85 km<sup>2</sup> are constituted by running and 35 km<sup>2</sup> by permanent standing waters [2].

Beside running, standing and subterranean water-habitat types, other water-related habitat types include wetlands and, in particular, bogs, fens and marshes. In addition, Slovenia has several specific, generally small aquatic habitat types such as thermal and karstic springs and tufa formations. Aquatic habitats, together with bogs and fens, are among the richest in species, and thus make a large contribution to Slovenia's biodiversity [2] [10]. The Regulation on Habitat Types is aimed at protecting 13 habitat types.

#### 3.3.1.1. Standing- and running-water ecosystems

The total length of Slovenia's watercourses is 26,989 km and the average drainage density of its hydrographic network is 1.33km/km<sup>2</sup>. Water from 81% of the Slovenian territory is drained to the Black Sea catchment area, i.e. the Danube river catchment including the Sava, Drava and Mura river basin; the rest is drained towards the Adriatic, of which the major part consists of the Soča river basin and its inflows, the Idrijca, Vipava, Reka, and the Dragonja and Rižana river basins. Slovenia's watercourses receive 85% of all water runoff from hills and mountains; for this reason, most of them are torrents [2].

Slovenia has around 1,300 permanent and seasonal/intermittent lakes with a total surface amounting to 68.93 km<sup>2</sup> or 0.3% of Slovenia's surface. The prevailing types are artificial lakes and water reservoirs. Our biggest natural lakes are Lake Bohinj and Lake Bled. Slovenia's largest water surface consists of karstic intermittent lakes when they are filled [2].

Watercourses, lakes and other water surfaces facilitate development of specific water flora and fauna species ranging from algae and flowering vegetation plants to non-vertebrates, fish and amphibians. Several other animal species are connected with these ecosystems, such as birds. Inland water ecosystems contribute to the landscape diversity by enriching the mosaic landscape structure.

In Slovenia, six habitat types directly related to running waters and six standing freshwater habitat types have been identified and documented. Numerous other habitat types are connected with them only indirectly. The issue of diversity conservation of running-water habitat types depends on the dynamics of watercourses. Morphologically changed watercourses are to be found everywhere across Slovenia; moreover, they are very frequent in its northeastern lowlands [2] [10] [13].

According to the conservation-status assessment of nine freshwater habitat types protected under the Habitats Directive, only 20% of these were considered to have favourable conservation status, while 35% of aquatic and riverine habitat types were assessed as having poor conservation status. Included in the latter category are the standing freshwater vegetation habitats (2.4) and alpine rivers with riparian vegetation habitat types. Assessment of inland water and wetland habitat types has shown that these are among Slovenia's most

threatened habitat types. Moreover, the trend for these habitat types was assessed as unfavourable [3] [25].

Inland waters and wetlands are an important habitat for numerous species, including some that live in water all their life, some that stay in water only during certain phase(s) of their development, and others that use inland water ecosystems as their feeding area or migration corridor.

Slovenia has 93 freshwater fish species, of which 77 species are autochthonous. This number may change as new species are found over the years. As regards vertebrates, Slovenian inland waters are home to two permanent species of hagfish; in the spawning period, these probably give shelter to the sea hagfish species. In 2007, the conservation status of 30 fish and hagfish species protected under the Habitats Directive was assessed. The conservation status for more than 85% of fish and hagfish species was assessed as poor (Figure 1.2) as a consequence of morphological and physical and chemical changes to watercourses and standing waters. Moreover, the conservation status for all three autochthonous species of freshwater crayfish was assessed as insufficient [6] [8] [19] [29].

Changes in watercourses morphology also had an impact on the conservation status of bird species. Regulation of river banks reduced nesting opportunities of Sand Martin (*Riparia riparia*) and Kingfisher (*Alcedo atthis*); changes to the dynamics of rivers affected Common Tern (*Sterna hirundo*), Brown-headed Gull (*Larus ridibundus*) and Kingfisher; degradation of sandbanks affected Little Ringed Plover (*Charadrius dublus*) and Common Sandpiper (*Actitis hypoleucos*). Overgrowing of *mrtvice* (old river meanders) and drainage of wetlands had an adverse effect on Spotted Crake (*Porzana porzana*), Little Crake (*Porzana parva*), Little Bittern (*Ixobrychus minutus*), River Warbler (*Locustella fluviatilis*) and Savi's Warbler (*Locustella luscinioides*). Some populations of hibernating birds are disappearing, including Common Goldeneye (*Bucephala clangula*), Eurasian Wigeon (*Anas penelope*), Common Teal (*Anas crecca*), but are being replaced by other more common species, such as Mute Swan (*Cygnus olor*), Mallard (*Anas platyrhynchos*) and Eurasian Coot (*Fulica atra*) [9] [10] [11].

The poor status of watercourses entails a threat to other species dependent on water ecosystems and wetlands. Several studies have been made of the group of amphibians and dragonflies. In 2007, the conservation status for both groups (in particular, amphibians) was assessed as insufficient. The conservation status of the majority of other species can only be guessed at in connection with indirect indicators, due to a lack of concrete data on higher species [6] [25].

#### 3.3.1.2. Groundwater ecosystems

The status of groundwater ecosystems is described in subchapter 3.6 on Cave ecosystems.

#### 3.3.1.3. Marsh and bog ecosystems

There are only 14 preserved raised bogs in Slovenia, with a total surface of only 1 km<sup>2</sup>. They cover the mountain areas of the Julian Alps, the Pokljuka and Jelovica plateaux, and the rocky parts of Pohorje. They lie on the most southern edge of the European bog distribution. Fens are found in the central and western part of Slovenia, mostly in the lowlands and the lower mountainous areas. It has been estimated that there are approximately 70 to 100 sites of fens which cover from 3 to 3.5 km<sup>2</sup>. Extensive studies of ecology, flora and vegetation in the raised bogs have been carried out, while only the typologically most important fens have been studied so far [2] [7].

In Slovenia there are approximately 91.5 km<sup>2</sup> of marshes and floodplain forests. The most extensive forests are Krakovski gozd, Šturmovci and the riparian forests of the Mura river. They cover two thirds of all identified wetlands in Slovenia and are the last extensive remains of flood-plain forests in Slovenia [2].

There are 12 habitat types of bogs, fens and marshes and Slovenia. According to 2007 estimates, of the 6 habitat types protected in compliance with the Habitats Directive, basic fens are among the most endangered habitat types. Their conservation status was assessed as bad, and the trend as negative (the surface cover is expected to continue to shrink) [6] [25].

### *3.3.2. Threats*

Due to their small surface area, water and wetland types of habitats are very vulnerable. In the past their social and economic value has been rather small (and is in some places also today); as a consequence, there are great pressures for their transformation and elimination. This threatens their biodiversity. The main reasons behind this are the following:

#### *3.3.3. Unsuitable water-management methods and modifications of the water regime*

Among the most important threats to the biodiversity of ecosystems of running waters is canalisation of rivers and streams, carried out to restrain their torrential activity and flooding, and to reclaim land for agriculture and building. This modifies their overall water regime and has a negative impact on biodiversity [2] [10].

Modifications of the water regime, such as hydrological improvements and water storage activities have a profound impact also on wetlands, in particular in the lowlands of Slovenia, where land is used for intensive agriculture and urban settlements.

##### *3.3.3.1. Pollution*

The main source of surface and ground waters pollution is agriculture with excessive and inappropriate use of fertilisers and pesticides. The consequences are increased eutrophication of still and running waters, modified chemical characteristics of waters and reduced biodiversity [9] [10].

Another important source of water pollution in Slovenia is untreated domestic and industrial sewage from urban areas. Numerous settlements and industrial plants are still not connected to sewage-treatment plants, and consequently waste waters are often released directly into groundwater or karstic aquifers. In addition, periodic releases of dangerous substances (mostly oils) from industrial plants are an important source of pollution. Such pollutants (released a few times a year) greatly jeopardise biodiversity in locally restricted areas [2] [10].

Biodiversity is also threatened by discharges of heated water from thermal power plants and the Krško nuclear power plant; as a consequence, downstream, some species have become extinct, while locally new species have appeared. In this sense, the most endangered watercourse is the Sava in its lower reaches [2] [10].

Unsuitable use of water, stream beds and other elements of bodies of water

Because of the increased need for renewable energy sources, the burden on groundwater is constantly increasing through the construction of hydroelectric power plants of various sizes. The construction of a power plant is an intervention in a body of water, resulting in a modification of its structure and function, which affects habitat types and consequently biodiversity. One such intervention in recent years was the construction of a chain of

hydroelectric power plants on the Sava. Construction of a large number of small hydroelectric power plants on small rivers and streams may also become a problem, since excessive abstraction of water from the natural stream bed may prove detrimental to local biodiversity [2] [10].

In some parts of Slovenia, fish farms are becoming very popular. These may adversely affect biodiversity through excessive abstraction of water, discharge of waste waters and eventual introduction of foreign species. The biodiversity of certain ponds is threatened due to the introduction of plant-eating fish (e.g. Grass Carp) [2] [10] [19].

Some mountain streams in the Alps are threatened by unsuitable and uncontrolled extraction of gravel and sand from their beds.

During periods of drought, ecosystems of smaller streams are threatened by uncontrolled abstraction of water used for irrigating agricultural land.

In the future, groundwater ecosystems will be increasingly jeopardised by the growing need for drinking water, unless losses in the process of pumping and conveying of water are adequately addressed [2].

#### 3.3.3.2. *Urbanisation and other activities affecting nature*

Urban areas and associated infrastructure are still being planned and constructed in natural flood-water retention areas of watercourses with a consequent need for flood-protection measures, which in turn affect the hydrological regime and reduce biodiversity. The construction of the motorway network has also had a negative effect on water ecosystems and wetlands, as traffic infrastructure is almost completely laid in valleys, basins, alluvial plains and karstic dolinas.

Wetlands continue to be considered socially and economically inferior land and as such are the target of drainage and urbanisation plans [10].

#### 3.3.3.3. *Grazing and overgrowing*

Fen habitat types are threatened by grazing, because of soil compaction and introduction of nutrients. The fringes of fen sites are also threatened by overgrowing [7] [10].

#### 3.3.3.4. *Invasive species*

Intentional or unintentional introduction of non-indigenous species, which include many that are extremely invasive, changes the structure and the function of water ecosystems and wetlands. In certain areas, invasive alien plant species (*Impatiens glandulifera*, *Reynoutria japonica*, *Solidago Canadensis*) in hydrophilic tall herb fringe communities have completely replaced indigenous plants. The spreading of invasive alien species is particularly significant along the banks of the Sava, Mura and Drava. The number of invasive alien species is also increasing on the banks of the river Kolpa

Biodiversity of watercourses in Slovenia is also threatened by the introduction of non-indigenous crustaceans and fish. Currently, 14 species of fish and 2 species of crustaceans that have been introduced in Slovenian watercourses either intentionally or unintentionally have been identified. They are mostly of Asian or American origin. Among the species that are most invasive are Rainbow Trout (*Oncorhynchus mykiss*), Pumpkinseed Sunfish (*Lepomis gibbosus*), Largemouth Bass (*Micropterus salmoides*), Grass Carp (White Amur) and Signal Crayfish (*Pacifastacus leniusculus*). The Signal Crayfish is present only in the Mura basin. However, data from neighbouring regions indicate that this crustacean is

extremely invasive, and a very significant threat to indigenous species (through disease transmission).

Biodiversity is also endangered by species that are transferred between the Adriatic and Danube drainage basins [19] [29].

#### *3.3.3.5. Climate change*

Climate change is affecting ecosystems of inland waters and wetlands in Slovenia. Changes in the distribution of fish populations along watercourses have been noticed. In particular, due to higher temperatures, certain cold-loving fish have moved upstream to higher altitudes. Climatic changes may also be responsible for the increasing number of natural disasters that have disrupted the structure of watercourses, and the increasing occurrence of droughts. Both have a negative impact on the biodiversity of inland water ecosystems.

### **3.4. Mountain ecosystems**

The Biodiversity Conservation Strategy of Slovenia does not set specific objectives concerning mountain ecosystems. Mountain ecosystems are conserved through maintenance of favourable conservation status for relevant habitat types.

#### *3.4.1. Status and Trends*

Mountain areas above 1,600 m cover 11% of the total territory of Slovenia. These are mostly limestone alpine areas. The highest peak is Triglav, at 2,864 m, and there are 43 more peaks over 2,500m. This alpine world is characterised by the altitude span between the bottom of the valleys and the top of the summits, which results in a great diversity of ecosystems and a wealth of species [24].

Over a relatively small surface there are numerous ecosystems rich in species. There are 11 habitat types within mountain ecosystems in Slovenia, the most specific being rock chasms, screes and Alpine grasslands. The zone above the tree line is relatively poorly studied with regard to ecosystems. Data on the status of preserved ecosystems come from individual studies carried out in the area of the Julian Alps and in certain mountain forests including the dwarf-pine zone. In 2007, conservation status was assessed for 6 habitat types protected under the Habitats Directive. The status of glaciers, which are retreating rapidly, is the cause of greatest concern. Vegetation growing in rock chasms is also threatened [6] [10] [25] [28].

Studies of plant and animal species are rare, and research is limited to specific locations or taxonomic groups. Furthermore, data are mostly obsolete. The best data are available for plant species and certain taxonomic groups, while from the territorial point of view, the Triglav National Park is the area for which data on species have been collected in the most systematic way [10].

Mountain regions are rich in endemic species. Up to 35–40% of all endemic species are found in rocky habitats and screes. Mountain regions are also the habitat of several species of European conservation concern, in particular birds, reptiles, butterflies and plants [10] [22].

#### *3.4.2. Threats*

Mountain ecosystems in Slovenia are not severely threatened. However, there are pressures and threats that do have an adverse effect on their biodiversity. These comprise:

#### *3.4.2.1. Unsuitable economic activities*

Mountain agriculture has traditionally been oriented towards the sustainable exploitation of natural resources. These include grasslands, which, as their exploitation is far from profitable, are being rapidly abandoned. With regard to the conservation of biological and landscape diversity, the problem of natural encroachment of vegetation on hay meadows and pastures is becoming increasingly serious. In areas where agricultural activity still continues, problems arise from the non-selective application of modern cultivation techniques (agricultural improvements and application of fertilisers on mountain pastures) [10].

Mountain forests have traditionally been managed in a sustainable manner, and their exploitation is no threat to biodiversity. However, in some cases the construction of the network of forest roads may be a problem [10].

The status of certain typical mountain species, such as chamois, is affected by hunting, in particular because it is difficult to find the right balance between natural causes affecting the game population and the effect of the volume of hunting. The result is an unbalanced gender and age structure of game and loss of population viability.

In certain easily accessible regions, economic exploitation of screes and gravel and sand deposits is becoming a problem. Numerous "illegal" borrow pits exist from which relatively small amounts of material is exported, alongside borrow pits, authorised by local authorities, where extremely large amounts of gravel are extracted (e.g. Pišnica, Soča, Nadiža, Matkov kot) [10].

#### *3.4.2.2. Tourism and leisure activities*

Mountain ecosystems are becoming increasingly vulnerable because of mass tourism and leisure activities. The most threatening activities include:

- Mountaineering, which poses a threat to biodiversity when large numbers of people take part;
- Climbing, which in cases of badly chosen climbing routes jeopardises habitats of certain birds or plants;
- Increasing the capacity of mountain huts without adequate treatment facilities, which increases pollution, in particular of mountain lakes;
- Creation of new ski centres and expansion of existing ones to sensitive areas;
- Modern outdoor activities (ski touring and helicopter skiing, riding motorcycles and motor sledges, mountain biking, paragliding, rafting, canyoning), which invade natural ecosystems that are often at the edge of their areas of distribution.

#### *3.4.2.3. Pollution*

Numerous mountain species are more sensitive to pollution because of the extreme conditions in which they live. Locally, mountain huts and mountain pastures are great sources of pollution. However, their impact can be contained.

More problematic is noise pollution caused by aircraft taking off, landing and flying over the habitats of sensitive animal species, which may, in some cases, provoke partial destruction or even extinction of individual species.

In some areas, light pollution is problematic, causing insects and consequently birds to disappear [5] [10].



#### 3.4.2.4. *Invasive species*

In mountain parts of Slovenia, in particular the Alps and the Dinaric Alps, invasive species are rare. However, the steep increase of such species along the western edge of the Dinaric region is a cause for great concern [10] [14].

Particularly problematic is the introduction of fish in the sensitive ecosystems of mountain lakes. None of the Slovenian mountain lakes had indigenous fish populations. All fish in these habitats were introduced by people, which disrupted the natural balance of these lakes [5].

#### 3.4.2.5. *Climate change*

Mountain organisms that live in extreme conditions are relatively effective bioindicators of global change. The impact of climate change is evident on glaciers, which are retreating, and on snow cover, which is less thick on average. In the long term, climate changes will result in depletion of biodiversity. It has already been observed that the habitat of the chamois has changed as the deer has pushed its habitat into higher altitudes due to temperature changes [10].

### **3.5. *Marine and coastal ecosystems***

The Biodiversity Conservation Strategy in Slovenia (2002) relating to marine and coastal habitat types sets the following objectives:

- To reduce the industrial, agricultural and urban pollution of water on the coast and in the hinterland to attain water quality standards such that exceptionally diverse, with regard to biotic characteristics, and well-preserved habitat types and habitats of endangered and endemic plant and animal species are not threatened;
- To restore to favourable status degraded habitat types, where possible;
- To prevent the introduction of alien species into the natural environment and the spread of introduced alien species to ecologically important areas [21].

#### 3.5.1. *Status and trends*

The Slovenian sea forms part of the Bay of Trieste in the north-east of the Adriatic. It is a shallow sea with a marine ecosystem characteristic of coastal seas and open waters of the Adriatic. Its maximum depth is 25 m, but most of the bay is less than 10 m in depth. There are extensive fluctuations of salinity and temperature, mostly due to the inflow of fresh water from several watercourses.

The coast is 47 km in length, and geologically is mostly of flysch. At the estuaries of rivers and creeks are characteristic floodplains that form a sandy and silty (muddy) sea-bed under water. Part of the coast is formed of high flysch cliffs that descend into the sea in stair-like formations [35].

In relation to the total territory of Slovenia, the surface of its sea and coast is rather small. However, marine and coastal ecosystems contribute significantly to our country's biodiversity. Different ecosystems are present, including precoraligen, plant communities of different *Cystozeira* species and meadows of sea-flowering plants. The vegetation of coastal ecosystems is sub-Mediterranean, with certain special features, including salt marshes, sandbanks and limestone plains. There are 12 marine and coastal habitat types in Slovenia. In 2007, the conservation status of habitat types was assessed. A total of 58% of marine

and coastal habitat types were assessed as good, while the remaining types were assessed as insufficient. However, as most habitat types are in areas under protection or in protected areas, the share of positively assessed habitat is high considering the high degree of urbanisation of the coast.

The flora and fauna in this region is poorly researched in comparison with other parts of the Adriatic. Most studies concern plankton organisms, while studies on benthic and nekton animals are scarce. In total, 1,850 animal species have been identified in the Slovenian sea, of which 1,600 are invertebrate species, which represent more than one fourth of all known animal species living in the Adriatic. The study "Endangered species and habitats in the Slovenian sea" (*Ogrožene vrste in habitatni tipi v slovenskem morju*), published in 2006, analyses 44 endangered plant and animal species and 16 endangered habitat types [35]. It is difficult to assess trends from the standpoint of conservation of biodiversity of marine and coastal ecosystems without targeted research. It may be said, however, that strategy objectives are not met to a sufficient degree. This is true for ensuring enforcement of protection regimes in protected areas (poor management and control) and for planning and carrying out interventions and activities in protected areas and their zones of influence. Furthermore, there are no programmes for restoration of degraded habitat types. Conservation of the integrity of marine ecosystems and of processes within these ecosystems has not yet been given its place in the process of planning of interventions and activities in the sea and its direct hinterland [10] [35].

### 3.5.2. Threats

The most threatened marine and coastal ecosystems are mostly protected by formal protection regimes and are thus in principle less endangered than in the past. However, biodiversity continues to diminish, due to a series of factors:

#### 3.5.2.1. Degradation and fragmentation of habitats

Urbanisation is among the factors that most significantly affect the biodiversity of coastal habitat types. Less than 20% of the coast, which is very fragmented and thus extremely sensitive, has been preserved in its natural status. These parts are currently under great pressure connected with the construction of traffic infrastructure and with tourism; projects of rehabilitation for degraded sea areas and coast restoring habitat types to favourable conservation status have yet to be carried out.

Some forms of fishing (bottom trawling, dredging) cause major physical changes on the seabed and destroy fauna and flora.

Gathering of sea dates and other mussels is not only directly harming populations of these species, but also causing loss of habitat for numerous marine invertebrates and algae. Fish stocks are also affected. To prevent commercial exploitation sea dates, police, customs and inspections authorities collaborate intensively on prevention activities, and awareness-raising campaigns are run for restaurant owners and their clients.

Farming of marine organisms is altering original habitats. Cultures of sea bass (*Dicentrarchus labrax*) and gilthead seabream (*Sparus aurata*) in cages reduce numbers of the surrounding indigenous population within a radius of 300 m around the cages. Large quantities of feed change ecological conditions, resulting in depletion of benthic invertebrate communities.

Marine and coastal ecosystems are further degraded by lack of oxygen (hypoxia and anoxia) within the demersal layer and by the disappearance and degradation of coastal wetlands and of benthic communities due to construction and other interventions.

#### 3.5.2.2. Pollution

Data on changes of fauna and flora of the Slovenian sea due to pollution are scarce. One of the most important sources of anthropogenic pollution of the sea is discharge of urban waste waters from coastal settlements and outfalls of polluted watercourses, which dramatically change the structure of benthic invertebrate communities. This pollution is expected to be reduced by 2017 with the construction of new waste treatment plants. However, the constant increase in the coastal towns' population, and in particular the extensive construction of holiday tourist facilities, risks nullifying work intended to improve the situation.

Coastal ecosystems are also threatened by pesticides and fertilisers used in agriculture [10] [35].

#### 3.5.2.3. Unsustainable fishing

Unintentional fishing, in which fish species that are not interesting from the fishing point of view are caught, is most detrimental. Particularly critical are catches of sharks and sea turtles. 17 sea turtles were unintentionally caught in 2004, and 25 more in 2005. More than half died [30] [31]. The number of professional fishermen and fishing vessels has been falling in recent years (in 2007, 174 vessels were registered, of which 81% were under 10 m in size, and only 93 vessels were actively used); however, due to increased fishing by the remaining fishermen the pressure on the ecosystems remains the same [37].

#### 3.5.2.4. Tourism and recreational activities

Tourism and recreational activities affect biodiversity through increased urbanisation of the area and construction of recreational facilities both in the sea and on the shore. Anchoring of tourist vessels is also problematic, particularly in the area of the sea meadows. Increased numbers of vessels result in an important increase of underwater noise, which negatively affects the loggerhead sea turtle (*Caretta caretta*) and dolphins, as well as other species of marine organisms. Increased traffic also increases the risk of oil pollution, and the likelihood of collisions between vessels and certain endangered species (porpoises, loggerhead sea turtles) [35].

#### 3.5.2.5. Invasive species

To date, 12 invasive alien species have been identified in the Slovenian sea – eight animal species and four species of algae. More invasive alien species are expected to be found, as 49 alien species have been identified overall in the Adriatic.

The most important factor in introduction of alien species is sea traffic, as ballast waters are the most non-selective method of transfer of organisms. Vessels also transport organisms (as fouling communities), so we may consider the Port of Koper bay the most probable area for alien species to spread from in the future.

Another factor is mariculture, which often involves cultivation of alien species. These alien species typically spread in the natural environment, where they are likely to be more competitive than their local indigenous relatives. Together with them, new species of commensals, parasites and illnesses are also spreading [35].

Inland coastal ecosystems have also been invaded by certain alien animal species, such as Nutria (*Myocastor coypus*) and Red-eared Slider (*Trachemys scripta elegans*), and among the plants, Japanese Honeysuckle (*Lonicera japonica*).

Due to absence of targeted research, no data indicating the detrimental impact of alien species on the Slovenian sea environment are available [10].

#### 3.5.2.6. *Climate change*

Climate change, and in particular temperature increases, favour the northward spread (tropicalisation) of marine species. The Slovenian sea has already been colonised by several species, such as *Drozd Labrus viridis* and Pelagic Stingray (*Dasyatis violacea*) in this way. There are no data on the impact of "warm-water" species on the Slovenian sea, and no concrete studies of this have yet been undertaken [35].

#### 3.5.2.7. *Illicit trafficking in endangered species*

Some species, such as Pen Shell (*Pinna nobilis*), are targeted by collectors for use as souvenirs, and are therefore subject to illegal gathering and trafficking. Data on the volume of trade of this kind are not available.

### 3.6. **Cave ecosystems**

The Biodiversity Conservation Strategy in Slovenia sets the following objective on cave habitat types:

- To maintain subterranean habitat types in ecologically important areas, and the entire subterranean fauna, at favourable conservation status.

#### 3.6.1. *Status and trends*

A substantial share of Slovenian territory is karstic (35% of the territory is carbonate bedrock and 8% of dolomite) with various subterranean ecosystems (caves and cave systems). Subterranean ecosystems in non-karstic areas are mostly interstitial spaces. These are extremely delicate ecosystems with highly specialised populations. The status of biodiversity in caves depends on the way that caves are exploited, the characteristics of land use and the status of surface waters that run into the underground areas. Cave ecosystems are closely linked to aquifers, of which there are two types – intergranular aquifers and fractured karstic aquifers. Intergranular aquifers are in the valleys of major watercourses (Mura, Drava, Sava, Savinja, Soča, Vipava), while fractured karstic aquifers are in areas covered by limestone and dolomite. In 2007, the conservation status of cave habitat types was assessed as insufficient due to excessive pollution of waters that run into the underground, pollution of caves with human waste, and unsuitable tourist use.

Typical for subterranean habitat types is extreme biological diversity of aquatic and terrestrial fauna with a high share of endemic species, among them the famous olm (*Proteus anguinus*). The subterranean fauna in Slovenia is among the most diversified on the planet. Of the terrestrial fauna, most is known about beetles and snails, and of aquatic fauna, snails and slugs (*Gastropoda*), isopods (*Isopoda*) and amphipods (*Amphipoda*) have been most thoroughly researched. Other animal groups have not yet been researched in detail. Because of this, new species are expected to be discovered in future years, most of them endemic. In comparison with cave habitat types, intergranular waters have been much less researched. It is evident, however, that the diversity of species in these waters is extremely rich [10].

Cave ecosystems are of vital importance not only for cave species, but also for species that use caves as their home (e.g. bats).

### 3.6.2. Threats

Animal species of cave ecosystems are specialised for typical subterranean conditions and have a limited ability to adapt to new conditions. As a result, the status of biodiversity in caves is affected both by interventions in cave ecosystems and by ground activities that have an impact on subterranean habitats. The main causes of threats to biodiversity of cave ecosystems are:

#### 3.6.2.1. Pollution

Direct pollution of cave ecosystems is mostly due to illegal waste landfills in the karstic environment (both on the surface and in caves and shafts) and above interstitial aquifers. Most endangered are caves close to settlements and traffic infrastructure.

A second important source of pollution is urban wastewater, which, due to a lack of adequate or sufficient treatment facilities, often runs untreated or inadequately treated directly into the underground and pollutes groundwater with organic and inorganic nutrients and other substances harmful to cave fauna and habitats.

Agriculture has a similar effect, as extensive application of fertilisers and pesticides pollutes the soil from which these substances are washed into groundwater.

Groundwater, particularly in the Karst region, is also threatened by occasional accidental spillages of hazardous substances [10].

#### 3.6.2.2. Activities affecting physical space

Urbanisation and construction of transport, utility and energy infrastructure significantly affect the biodiversity of cave ecosystems as well as the landscape diversity of the karstic world. Such interventions result not only in pollution, but often in physical destruction of cave ecosystems. One major intervention of this type was the construction of the motorway network, which encouraged growth of settlements in sensitive areas.

Cave ecosystems are also affected by hydro-technical interventions at the surface, and by forest felling, which change the groundwater regime and increase erosion [3] [10].

#### 3.6.2.3. Tourism and recreational activities

Biodiversity in subterranean, particularly cave, ecosystems is also threatened by visiting, unsuitable cave closures and management of caves for tourist purposes. An unsuitably closed cave may hinder the passage of bats and affect the cave climate. Lighting of caves and organic substances brought by visitors also tend to modify the ecological characteristics of caves. Winter visits to caves where bats hibernate may endanger bat populations. Uncontrolled tourist visits to caves with consequent pollution and physical destruction of cave resources are a major threat to cave ecosystems biodiversity.

#### 3.6.2.4. Uncontrolled collecting of cave fauna

Local cave fauna is seriously affected by (amateur) collecting of animals, in particular beetles, as non-selective traps, set for a longer period, may have a decisive impact on these populations. This threat is most serious for endemic species living only in certain caves. The most problematic include Volčja jama on Nanos, where the local population of *Leptodirus hochenwartii* was exterminated (monitoring in recent years has not found any more beetles in the cave) and the cave on Pucov kucelj, where many illegal traps have been discovered.

### 3.6.2.5. Invasive alien species

Data on invasive alien species in cave ecosystems in Slovenia are not available. It is known, however, that due to pollution, and in particular due to the introduction of nutrients into aquifers, ground species do penetrate caves and threaten the subterranean fauna [10].

## 3.7. Genetic resources

Alongside the objectives in Chapter 2.1.4 above, the Biodiversity Conservation Strategy in Slovenia (2002) relating to preservation of genetic diversity defines a further two objectives:

- To conserve wild animals *ex situ* when *in-situ* conservation is not possible or is seriously threatened;
- To conserve indigenous domestic breeds and varieties for the production of food, materials and medicines, and to conserve the genetic resources of wild relatives of domesticated breeds and varieties [21].

### 3.7.1. Status and trends

One of the three levels of biodiversity is genetic diversity, which is the basis for diversity between individuals within species and diversity between species. It is important as it allows adaptation to changing conditions in the environment and is the basis for the evolution of species. For most species in Slovenia, genetic diversity has not yet been studied. Species living in Slovenia contribute to global genetic diversity not only with their variety, but also because many species here are endemic. Genetic diversity is fed not only by wild plant and animal species, but also by domesticated varieties and breeds. Genetic diversity of crops and animal breeds, and of certain woody forest plants has been thoroughly researched. A total of 29 breeds and 169 varieties of indigenous and traditional breeds and varieties of domestic animals and plants have been identified [10] [12] [34] [36]. The main objective on genetic diversity is *in-situ* protection of genetic resources through conservation of adequate sizes of effective populations. *Ex-situ* conservation in botanical gardens, zoos and gene banks is a further measure taken in relation to species and populations that are threatened to the extent that conservation *in-situ* proves insufficient [10] [36].

Genetic resources in agriculture (varieties, breeds, ecotypes and local populations and their non-domesticated relatives) and forests include:

- Plant genetic resources, including varieties in meadows and pastures and forest genetic resources,
- Animal genetic resources, including fish genetic resources,
- Microbe genetic resources (including rhizobia, fungi and yeast, as well as collection of living mycorrhizal fungi at the Herbarium and Mycotheca of the Gozdarski inštitut Slovenije).

There are 177 recognised domestic animal breeds in Slovenia. Of the 12 indigenous breeds of domestic animals, 8 are threatened. Indigenous breeds where adaptation to demanding breeding conditions is particularly pronounced (Carniolan bee, Jezersko-solčavska sheep) show greater resistance to foreign breeds. In addition, the existence of 7 of 17 traditional breeds is also threatened. Intensive professional engagement concerning conservation of domestic animal breeds, the creation of a gene bank and establishment of breeders' associations has helped to improve the status of threatened breeds. Conversely, the situation of most popular traditional breeds is worsening, as they are not subject to special protection regimes. Some are unable to resist the competition of economically more productive breeds from developed countries, so their numbers are decreasing [12] [36].

Slovenia belongs to the Mediterranean and European gene pool. As Slovenia does not have a single gene bank, genetic resources are managed by a series of scientific-research institutions. The Seed bank for forest woody plants (part of the Slovenian Forest Gene Bank) stores mostly pine, spruce, larch seeds, some deciduous trees seeds, while recalcitrant seeds of deciduous trees, such as oak, which is difficult to store, are largely absent [10].

Integral part of the Slovenian Forest Gene bank are Forest Gene Reserves (36 in 2010) for in situ conservation purposes.

Slovenia is taking part in the EUFORGEN programme dealing with genetic resources in forests. The programme is based on the resolutions of the ministerial process Forest for Europe. The Slovenian Forestry Institute is the key partner from Slovenia in this programme.

In 2011 the project EUFGIS (AGRI GEN RES) will be finished. This project establishes the European information system on forest genetic resources. It will create an online information system and a documentation platform for forest genetic resources (FGR) inventories in Europe. It is based on dynamic conservation units – Forest genetic reserves in 33 European countries. In Slovenia there are 36 units for 20 of forest tree species.

Slovenia has already adopted some measures for *in-situ* conservation of animal genetic resources. The programme has been implemented for livestock, and pilot projects are being carried out for other animals. Conservation of DNA is systematically carried out for Lipizzaner horses, and an extensive collection of tissues and DNA samples is maintained for some fish species, in particular salmonid species. The gene bank in livestock breeding is managed by the Zootechnical Department of the Biotechnical Faculty of the University of Ljubljana as a public service.

The Slovenian plant gene bank, established more than 10 years ago, brings together a series of institutions harbouring freely accessible *ex-situ* collections of indigenous plant genetic resources. The Slovenian plant gene bank includes the Agricultural Institute of Slovenia, the Agronomy Department of the Biotechnical Faculty of the University of Ljubljana, the Slovenian Institute for Hop-growing and Brewing, and the Faculty of Agriculture and Life Sciences of the University of Maribor. These *ex-situ* and *in-vivo* collections store more than 4,500 samples of indigenous plant genetic sources and may provide basic data on them. Besides indigenous ecotypes, these collections also store samples of all indigenous and domesticated varieties of agricultural plants.

### 3.7.2. Threats

The main threat to genetic diversity of indigenous breeds is their genetic depletion because of downsizing of populations and fragmentation of the habitats of smaller populations.

Genetic diversity of domestic breeds and varieties, however, is threatened by globalisation of the agricultural market, which has introduced alterations in agricultural practices. Genetic erosion is increasing because of the introduction of new, highly productive varieties, which are more suitable for intensive agriculture [10].

## 4. DATA SOURCES

### 4.1. Information sources and databases

Data on the status of biodiversity in Slovenia are to be found in monographs, and in articles published in journals and on the web.

The quantity of data available on individual species or groups of species varies considerably. Atlases of geographic extent exist for a limited number of groups. Species that are subject to

protection under the Habitats Directive and the Birds Directive are, in general, better covered, although there is also a severe lack of synthesis data for these species [10] [16].

There is no single database on biodiversity in Slovenia; data are kept in a variety of databases, some of which are not freely accessible. A total of 72 *ex-situ* databases have been identified, of which 3 are major databases (e. g. Herbarium of the Ljubljana University). Data on domestic-animal breeds are included in a special information tool called Domestic Animal Diversity Information (DAD-IS) [12].

Collection and storage of data on biodiversity has recently become more systematic, and is expected to produce tangible and concrete results in a few years. The Institute of the Republic of Slovenia for Nature Conservation, working with the Environmental Agency of the Republic of Slovenia, has established a Nature Conservation Atlas that contains data on biodiversity in ecologically important areas and in Natura 2000 sites.

The Centre for Cartography of Fauna and Flora is a private not-for-profit organisation established in 1996. In collaboration with external experts, the centre maintains a database of over 25,000 plant and animal species (45,000 names), which contains more than 1,100,000 items concerning 32,000 sites. This is probably currently the largest such database in Slovenia.

<http://www.natura2000.gov.si/>

#### **4.2. Monitoring and research**

A comprehensive monitoring system for biodiversity in Slovenia is yet to be established. Under the Natura 2000 Operational Programme 2007, monitoring of 8 (forest) habitat types has been established, covering 61 species (in particular birds, bats, and beetles), while for a further 21 species, the method of monitoring is in development and monitoring is planned.

The national programme of research in Slovenia is not harmonised with nature-conservation requirements. Financial and personnel resources are mainly channelled into biotechnology research, and much less into classical biology research, with the exception of a small number of targeted projects [16].

### **5. IMPLICATIONS OF CHANGES ON HUMAN WELL-BEING**

The quality of the environment in which people live is certainly one element that has a significant impact on their well-being. Biodiversity, of which people are a part, is crucial for maintaining the long-term viability of agriculture, forestry and fishing, and is the basis for numerous industrial procedures, including production of new drugs. It is specifically the modification of ecosystems and exploitation of natural resources that made development and the rapid increase in human wellbeing possible. Any intervention that reduces biodiversity is, however, likely to have long-term consequences for ecosystems and for quality of life. These consequences may be either direct or indirect, and have an impact either locally or globally.

From the economic and social points of view, biological and landscape diversity importantly affects one of the liveliest economic sectors in Slovenia – tourism. A very significant part of Slovenia's tourist industry exploits the good conservation status of the natural environment with its biodiversity and landscape variety. This increases the emotional and recreational value of the tourism experience in Slovenia, helping people to relax and thus contributing to their improved health.

In general, people in Slovenia are still insufficiently aware of how important the conservation of biodiversity is for their quality of life. Unfortunately, most people only become aware that



depletion of biodiversity in terms of genes, species and ecosystems means an alteration of food sources, reduced accessibility of natural resources (wood, fish, game) and materials necessary for industrial production, and consequently, a degradation of quality of life, when ecological catastrophes strike. Visible events include cases of pollution of watercourses resulting in dead fish and a consequent depletion of their biodiversity.

The media increasingly covers the issue of a global reduction of biodiversity, in particular in connection with climate change and – most recently – with invasive alien species. Because of the rising number of natural catastrophes in Slovenia and information on the spreading of new diseases, increasingly people are conscious that destruction of nature and its biodiversity lowers the quality of their lives.

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## CHAPTER II CURRENT STATUS OF NATIONAL BIODIVERSITY STRATEGIES AND ACTION PLANS

### 7. OVERVIEW OF THE IMPLEMENTATION OF THE CBD IN SLOVENIA

#### **7.1. 1. Basic premises**

To evaluate the implementation of the CBD, we analysed past activities by which Slovenia fulfilled its convention obligations, especially the implementation of the *Strategy for Biodiversity Conservation in Slovenia* adopted in 2001 and the second *National Environmental Action Programme* (NEAP) adopted in 2005, which includes a chapter ("National nature and biodiversity conservation programme") detailing the tasks and measures for the period 2005–2012 by which Slovenia is indirectly implementing CBD objectives. The measures in the NEAP in the field of nature conservation stress especially *in-situ* conservation and education in the field of nature conservation. Much less stress is placed on *ex-situ* species conservation, which is understandable in view of the relatively high level of natural environment conservation in Slovenia. NEAP does not foresee any special measures for certain areas of the convention, but these are mostly areas appropriately regulated at the legislative level and the implementation of measures is imposed by the provisions themselves. The overall evaluation is that of all convention tasks Slovenia is weakest in implementation of the obligation to access genetic resources and share the benefits derived from their use (ABS – the third objective of the convention), while slight progress has been noted in the fields of monitoring of the components of biodiversity, taxonomy and alien species in the last few years. Accordingly, legislative acts and programme documents for the conservation of individual species have been prepared and adopted. In 2004, Slovenia became a Member State of the EU and thus undertook commitments for the conservation and sustainable use of biodiversity in accordance with EU regulations. Therefore activities were aimed primarily at harmonisation of legislation with EU regulations. The implementation tasks in the period, too, focused especially on EU requirements (e.g. establishment of the Natura 2000 network, emphasis on species and habitat types of EU directives).

2005 saw the publication of the results of *The National Capacity Self-Assessment for Global Environmental Management* (NCSA) project for three Rio conventions. The thematic profile of the implementation of the CBD summarised the shortcomings and requirements of the country for implementation of the CBD (Kus Veenvliet, 2005). It stressed the need to improve the efficiency of the implementation of the adopted provisions at the systemic level and to supplement the provisions in force with planned programme documents. Many problems in the implementation of the CBD also derived from weak cross-sectoral harmonisation. This was especially prominent in the field of biodiversity conservation strategy, because biodiversity components are used and managed by several sectors. Emphasis was therefore placed on the need for a standing cross-sectoral group monitoring the situation in the field of nature conservation and therefore the CBD. In the 1990s, the attention devoted to nature conservation undoubtedly increased, which led to an increased number of prescribed tasks. Thus NEAP planned numerous activities in the field of education, targeting especially raising the awareness of the general public, but unfortunately not of employees in sectors in fields affecting biodiversity. What was also stressed was the need to build capacity in the field of nature conservation, provision of financial resources and implementation of new fiscal and income-tax incentives.

These three documents are the basis of the overview of the implementation of the convention objectives in Slovenia and achievements of objectives for 2005–2009 as summarised by the Fourth Report on the Implementation of the Convention. In addition, the

report covers communications in accordance with the EU Habitats Directive and the implementation of the EU Biodiversity Action Plan (BAP Communication, 2006). The report is also an upgrade of the reports prepared in 1997, 2002 and 2005.

## 8. STRATEGY FOR BIODIVERSITY CONSERVATION IN SLOVENIA

At the end of 2001, the Government of Slovenia adopted the *Strategy for Biodiversity Conservation*,<sup>3</sup> which summarises the three main CBD objectives: biodiversity conservation, sustainable use of its components, and access to and sharing of advantages derived from the use of genetic resources. The strategy outlines objectives and directions for the conservation of ecosystems through the conservation of favourable status by a special stress on endangered habitat types (marine, coastal and inland waters, fens and marshes, wet and dry grasslands, caves and forests), landscape-diversity conservation, species conservation, genetic-diversity conservation and *ex-situ* biodiversity conservation. Biodiversity conservation affects the fields of agriculture, forestry, hunting and fishing, water management, industry and energy, transport and tourism, significantly affecting the sustainable use of biodiversity components. Thus the strategy also provides plans for these activities for a ten-year period (2002–2012). These activities are defined in a special chapter of the strategy. Successful conservation of biodiversity and sustainable use require support activities including legislative and economic mechanisms, directives in the field of spatial planning and regional development. Important components include monitoring of biodiversity and its components, and research and development and technologies; the right to use knowledge is specific to this latter component. The objectives of biodiversity conservation and sustainable use must be integrated in programmes of education and awareness-raising, and exchange of information and cooperation at the national level must be enabled.

The strategy determines that monitoring of effective achieving of objectives will be provided by the working group for biodiversity, which is intended to operate within the Sustainable Development Council. The council now operates under the auspices of the Government Office for Development and European Affairs and occasionally addresses issues concerning nature protection and sustainable development. The working group, however, has not been established. In 2006, the EC adopted BAP, on the basis of which the Member States report on the situation and implementation of the EU legislation and strategic directions in the field of nature and biodiversity conservation (see...). The analysis of BAP measures produced for Slovenia in 2006 (Kus 2006) was primarily intended for the preparation of the **Natura 2000 Site Management Programme (Operational Programme 2007–2013)**[4]. The inter-ministerial action plan for biodiversity conservation, which provided a spatiotemporal plan for the implementation of the strategy, was not adopted.

The strategy also determines material directly or indirectly referring to the release of genetically modified organisms (GMOs). The most important among these is the declaration and conservation of areas where GMO are not released into the environment. In view of this strategic direction, Slovenia should prevent the cultivation of GMOs in protected areas and areas included in the Natura 2000 network. The latest acts on the establishment of protected areas define the prohibition of introducing GMO.

The preconditions for effective achievement of the strategy objectives are oriented to the long term and thus still provide strategic direction for the achievement of objectives.

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<sup>3</sup> Strategy for Biodiversity Conservation in Slovenia. Ministry of the Environment and Spatial Planning of the Republic of Slovenia, 2002.

**Table of preconditions for effective implementation of strategy objectives**

<p>Government to provide reciprocity, partnership and participation in biodiversity conservation at different levels.</p>	<p>Examples of good cooperation in individual cases, such as the <b>Natura 2000 Site Management Programme (Operational Programme 2007–2013)</b>, management of large carnivores, establishment and management of protected areas, agri-environmental programmes and similar. PARTLY</p>
<p>Willingness of public and sectors to integrate biodiversity strategy objectives in their strategies, programmes and projects.</p>	<p>Sectoral planning documents include requirements for biodiversity conservation, especially through nature-conservation guidelines. For Natura 2000 sites, integration is defined in the <b>Natura 2000 Site Management Programme (Operational Programme 2007–2013)</b> and binding on planning institutions. Our experience is good in the integration in forest-management plans, and partly also in hunting- and fishing-management plans. Assessment systems including biodiversity are of key importance in planning and implementation of interventions. In terms of law, the situation is satisfactory, but implementation may still be problematic, especially due to incomplete and non-systematic data available on biodiversity. PARTLY</p>
<p>Participation of all principal stakeholders of government sectors, local communities, non-governmental organisations, land owners and broadest public in integration of strategy objectives and implementation of aims of biodiversity conservation, following the same strategic principles in achieving objectives and thus providing mutual assistance.</p>	<p>See above. PARTLY</p>
<p>State services largely use the existing legal, financial and other socioeconomic mechanisms at international, national, regional and local levels to achieve strategy objectives in the framework of their activities.</p>	<p>Legislation is somewhat appropriate; problems lie in implementation, with some possibilities unexploited and inspection services inefficient. PARTLY</p>
<p>Willingness of responsible authorities for implementation of legislation and adoption of suitable secondary legislation.</p>	<p>Secondary legislation has been largely adopted, implementation depends on available financial and human resources. PARTLY</p>

Appropriate monitoring and supervision of legislation implementation.	Systematic monitoring of biodiversity has not been established, except for certain species and habitat types (long-term resources have not been earmarked in these cases). The system is gradually developing. Supervision of legislation implementation is inefficient. PARTLY
Timely implementation of provisions from the field of nature conservation and spatial intervention, including those parts related to implementation of the requirements of EU Directives on the conservation of wild birds and on the conservation of natural habitats and wild fauna and flora.	EU provisions have been appropriately transferred to national legislation and are being implemented in this framework. YES
Timely implementation of provisions from the field of GMO management.	Implementation of provisions is covered by the Report on the Implementation of the Cartagena Protocol on Biosafety.
Appropriate monitoring and supervision of strategy implementation.	No systematic monitoring of strategy implementation. NO

By adopting the strategy, Slovenia set objectives and directions for the achievement of three basic objectives of the CBD at the national level. The strategy was not supplemented and did not include any additional directions adopted at individual sessions of contracting parties; instead, additional documents were adopted as an indirect response to these requirements. The ten-year strategy will be revised and amended in 2010 in accordance with new strategic directions at regional (EU) and international levels.

### **8.1. Achievement of Objectives of Strategy for Biodiversity Conservation**

The general objective of the Strategy for Biodiversity Conservation in Slovenia is conservation of ecosystems through maintaining favourable status of habitat types. More detailed objectives and directions should contribute to achievement of this objective. At the ecosystem level, detailed objectives were determined for the biodiversity of coastal, marine and inland waters, for agricultural and forest biodiversity, and for landscape diversity. Underground biodiversity was included as a special feature. In addition, objectives for species and genetic biodiversity were included.

The basic measures to achieve the objective of conservation relate to establishment and management of the network of Natura 2000 sites and establishment of protected and internationally important areas, ecologically important areas (EIA) and valuable natural features at national and local levels. The differences show in individual types of ecosystems, securing of their vitality, acquisition/provision of financial resources, joint implementation of international agreements, and integration of the Rio conventions (1992).

The overall objective of the strategy is a long-term vision gradually achieved by implementation of a range of measures at all levels of operation. Regardless of the adopted measures, especially the extended scope of protected areas and establishment of the Natura 2000 site network, the general condition of biodiversity is still not satisfactory. Since

appropriate systematic monitoring of the condition of species or habitat types has not been established, it is difficult to evaluate the achievement of individual goals of the strategy.

From the data available in 2007, Slovenia prepared a report in 2008 on the status of conservation of species and habitat types from the annexes of the Habitats Directive. Despite deficient data, this is the significant as the first overview of the conservation status of certain species and habitat types in Slovenia, showing to a certain extent the status of conservation of biodiversity as well as the status of knowledge about it.

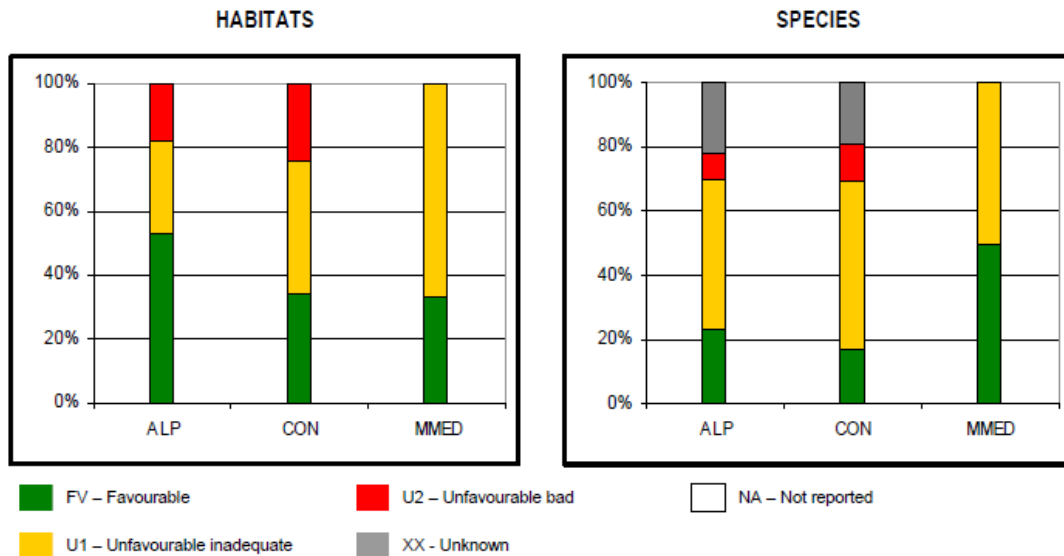


Figure 2.1: Assessment of conservation status by biogeographical region (in %).

Source:

[http://circa.europa.eu/Public/irc/env/monnat/library?l=/habitats\\_reporting/reporting\\_2001-2007/ms-reports\\_summaries&vm=detailed&sb=Title](http://circa.europa.eu/Public/irc/env/monnat/library?l=/habitats_reporting/reporting_2001-2007/ms-reports_summaries&vm=detailed&sb=Title)

The data indicate an increased level of hazard in the continental part of the country, which is expected since this area has a greater population density and higher level of human activity.

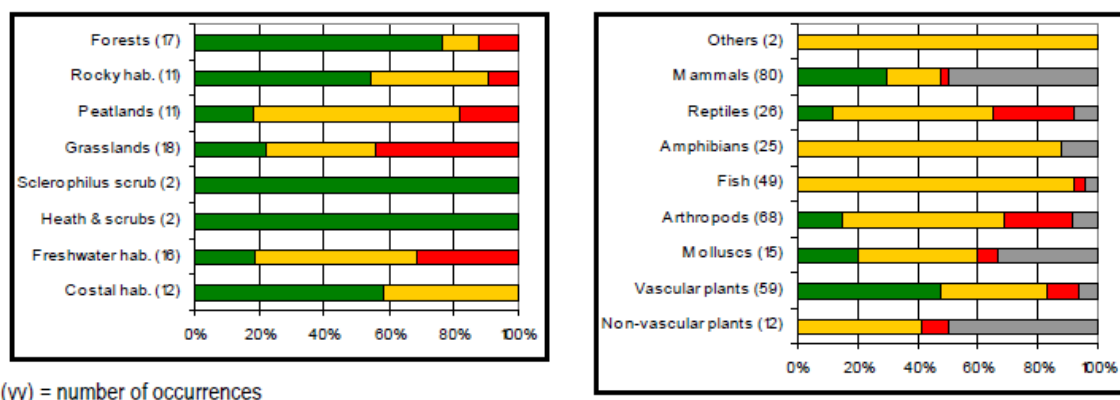


Figure 2.2: Assessment of conservation status by habitat/species (in %).

Source:

[http://circa.europa.eu/Public/irc/env/monnat/library?l=/habitats\\_reporting/reporting\\_2001-2007/ms-reports\\_summaries&vm=detailed&sb=Title](http://circa.europa.eu/Public/irc/env/monnat/library?l=/habitats_reporting/reporting_2001-2007/ms-reports_summaries&vm=detailed&sb=Title)



The results of the reports show that the least conserved habitat types were grasslands and wetlands, while the least conserved species particularly included fish and amphibians. The level of knowledge of the species situation is deficient in some groups, and risk evaluations reflect this (see Chapter 1).

In view of the situation, the supplemented **basic principles** provided in the strategy are still relevant for the achievement of the CBD objectives in Slovenia:

- Further protection and conservation of areas of key importance for maintaining of favourable status for habitat types: in the reporting period, activities for the protection of new sites were underway (e.g. Radensko polje Landscape Park, Kamniško-Savinjski Regional Park). 2008 saw the establishment of the Ljubljansko barje Landscape Park and the establishment of management in Kolpa Landscape Park (2006) and Strunjanske soline Landscape Park (2008), as well as the adoption of the amended Triglav National Park Act (2010). Due to closer integration of the public, procedures are more extended, while better cooperation may be the basis of more efficient conservation of these areas;
- Provision of appropriate mechanisms for conservation and sustainable use of protected areas with regards to the Natura 2000 network: the adoption of the **Natura 2000 Site Management Programme (Operational Programme 2007–2013)**, has established obligations for integration of competent sectoral policies in the implementation of measures for conservation and sustainable use relevant to specific requirements of individual Natura 2000 sites;
- Provision of sufficient financial sources and mechanisms: financial sources are insufficient, and exploitation of the existing financial instruments is too inefficient;
- Efficient management of the ecological network to improve the status of endangered and key species and their habitats and ecosystems: the ecological network has been established and consists of protected and ecologically important areas (including Natura 2000 sites). Stress is placed on existing areas and transitions; only in individual cases are activities focused on the reconstruction of transitions (e.g. "renaturation" of river systems). It must be stressed that there is no comprehensive management of the ecological network but that implementation is largely left to individual sectors (e.g. agriculture, forestry, water management), while the integrity of the network is threatened by the construction of infrastructure and urbanisation;
- The establishment of appropriate coordination between different initiatives for mitigation of and adaptation to climate change to achieve synergetic effects in accordance with relevant international environmental agreements (especially CBD, Ramsar, UNFCCC and UNCCC);
- Coordination of activities and incentives of various international environmental-protection and nature-conservation agreements and the CBD Convention to achieve maximum efficiency of activities and results.

The principal legislative and other measures for the conservation of biodiversity adopted on the basis of the strategy (especially NEAP) are presented in the table at the end of this chapter. These measures have contributed to improved identification and monitoring of biodiversity status, cooperation with other sectors, especially in the field of agriculture, forestry and water management. Improved cooperation with other sectors is also evident.

## **8.2. Conservation of Landscape Diversity (Annex 1)**

In Europe, awareness of the value of landscape has received a great deal of attention in the past decade. This is demonstrated by the fact that the European Landscape Convention has been ratified by 30 countries, including Slovenia. In accordance with its principles and objectives, landscape has an important role in the quality of life of individuals and society in

general, in cultural, ecological, environmental and social aspects. Landscapes are the key element of biodiversity and valuable natural features, representing, and strengthening the European identity, forming the local culture and affecting the development of economic activities, especially recreation and tourism. Their protection, management and planning are the right and duty of everyone.

Slovenian landscapes have not undergone any modern large-scale reorganisation that would significantly change their appearance. They are characterised by relatively high diversity, a high level of natural conservation and the conservation of cultural elements of the landscape. In the last decade, Slovenian landscapes have been affected by major infrastructure developments, such as the construction of roads, gas pipelines and transmission lines; the construction of railway corridors is also envisaged. Major infrastructure developments have a considerable effect on the structural characteristics of the landscape and the quality of experiencing it. A considerable number of smaller degradations can be observed, such as unregulated or poorly regulated quarries and gravel pits, clay pits, over-regulated watercourses, in some places inadequately designed infrastructure (major cuttings and dams), inappropriate land reclamation and dispersed settlements. Landscapes in the valleys of Slovenia are heavily influenced by intensive human activity and interventions.

Three ministries are involved in the development, protection and management of landscapes: the Ministry of the Environment and Spatial Planning, the Ministry of Culture, and the Ministry of Agriculture, Forestry and Food. "Landscape" is defined in the Spatial Planning Act (2007) in terms of spatial planning and in the Nature Conservation Act (2004) in terms of the importance of landscapes for biodiversity conservation. Cultural aspects of landscapes that are important for preserving cultural heritage are defined in the Cultural Heritage Protection Act (2008).

Protected areas for nature conservation have increased in recent years and now cover 12.6% of Slovenian territory. One conservation objective in the founding acts for protected areas is conservation of landscape diversity. **The adopted Natura 2000 Site Management Programme (Operational Programme 2007–2013)** provides numerous measures (e.g. conservation of hedges, grasslands, meadow orchards) contributing to the conservation of landscape diversity.

In the field of spatial development, a Spatial Development Strategy of Slovenia has been adopted, determining, *inter alia*, the areas of national recognisability and natural quality of the landscape (source: SPRS, Ur.l. RS, No. 76/04).

In terms of reduction of impact of plans and interventions on the environment, the key role is played by the procedure of comprehensive environmental-impact assessment and environmental report, which defines, describes and evaluates potentially important environmental impacts of the implementation of a plan or programme. It evaluates impacts on biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material attributes, cultural heritage, including architectural and archaeological heritage, landscape, and the links between these factors.

#### DIRECTIONS

- To achieve sustainable development based on a balanced and harmonious relationship between social needs, economic activity and the environment;
- To define the characteristics of landscape and landscape diversity important for conservation of biodiversity (Article 35 of NCA);
- To define, in the elaboration of management plans for protected areas, objectives, tasks and measures for the conservation of those landscape elements that contribute to the conservation of biodiversity;

- To consider, in planning spatial arrangements and construction, the characteristics of landscape important for the conservation of biodiversity;
- To ensure, in planning development, the implementation of environmental-impact assessment from the aspect of impact on landscape diversity;
- To support those uses of space that are economically efficient, while enabling the maintenance of landscape characteristics, especially in connection with agri-environmental programmes and responsible spatial development.

### **8.3. National environmental action programme (NEAP): Nature and Biodiversity**

The objectives set by the strategy are also achieved through the implementation of NEAP, which has as integral parts the national programme of valuable natural features and biodiversity conservation, monitoring of forest habitat status, protection of soil and GMOs [40].

#### *8.3.1. National Environmental Action Programme*

Paragraph 1 of Article 35 of the Environmental Protection Act determines that the National Assembly of the Republic of Slovenia shall adopt, following the proposal of the Government, a plan (NEAP) that includes long-term objectives, directions and tasks in the field of environmental protection. Paragraph 3 of the same Article provides that NEAP shall also contain the national nature-conservation programme (NNCP) under the provisions on nature conservation. In addition, Article 94 of the Nature Conservation Act provides that NNCP as adopted within NEAP in 2005 shall cover biodiversity conservation and protection of valuable natural features, and determine the scope of public interest in the conservation of biodiversity and protection of valuable natural features for at least 10 years.

The contents of NNCP are objectives and strategic directions for the following:

- Biodiversity conservation through a programme of measures for the protection of plant and animal species, their habitats and ecosystems;
- Protection of valuable natural features through a programme for the establishment of protected areas and the restoration of valuable natural features;
- The manner of fulfilling international obligations;
- Education in the field of nature conservation;
- Public awareness of the importance of nature conservation;
- Provision of financial resources for nature protection.

The Nature Conservation Act also provides that this content (tasks) shall be detailed in operational programmes adopted by the Government. The contents of some operational programmes are also determined in detail by other acts. The Biodiversity Conservation Strategy in Slovenia foresees as a form of operational programme the preparation and implementation of an inter-ministerial four-year action plan of conservation of biodiversity (species, ecosystems or habitat types and genetic sources) for the development policies of principal sectors.

#### *8.3.2. Upgrading the Institutional System of Nature Conservation*

The organisational framework for institutional operation in nature conservation is based on five institutions:

- Nature Conservation Division within the Environment Directorate at the Ministry of the Environment and Spatial Planning;
- Nature Conservation Division within the Environment Office at the Environmental Agency of the Republic of Slovenia;

- Inspectors for nature conservation within the Inspectorate of the Republic of Slovenia for the Environment, Spatial Planning and Energy;
- Institute of the Republic of Slovenia for Nature Conservation;
- Managers of protected areas.

OBJECTIVE: Establishment of a comprehensive system of nature conservation and efficient implementation by 2008.

The updated environmental legislation and adoption of secondary legislation has established a system of nature conservation, but its effective operation has not yet been achieved. Deficiencies are apparent especially in the operation of inspection services and, generally speaking, the still insufficient cross-sectoral cooperation.

The nature-conservation system set up by the Nature Conservation Act as well as by many other provisions is extremely complex. It is linked to and intertwined with many other sectoral systems within the environmental field, as well as those outside it. The daily application of these provisions, the operation of individual parts of the system, from professional services to supervision and other services, and lastly the operation of some divisions within the Ministry of the Environment and Spatial Planning open numerous issues of operational implementation of tasks in nature conservation. This observation is made without any intention of commenting on individual solutions or broadly clarifying their intentions and reasonability; it is merely the result of the long-term ambition to provide a maximally clear and complete systemic overview and to point out the meaning of comprehensiveness in such a system, its areas of intervention and ways of understanding and using it to achieve the key intention – efficient nature conservation.

The comprehensive *system of legal norms* encompassing the nature-conservation system consists of the Constitution of the Republic of Slovenia, international law, European Union law, administrative law (of environment protection and nature conservation), and civil, criminal and misdemeanour law.

The comprehensive *system of nature conservation* with all its elements is regulated by *nature-conservation law* consisting of the following legal sources:

- Constitution of the Republic of Slovenia;
- International conventions;
- Environmental Protection Act, Nature Conservation Act;
- Cave Protection Act and acts establishing protected areas (designating natural monuments);
- Decrees issued by self-governing local communities establishing protected areas (designating natural monuments);
- Secondary legislation as executive provisions of Government and ministers;
- Decisions, permits and consents.

Nature conservation is directly regulated by the Nature Conservation Act, which constitutes a systemic provision establishing a comprehensive system of legal protection of nature, and by secondary legislation based on it. The Act establishes its own mechanisms of protection, with the field remaining integrated in the system of environmental protection with the following legal institutes:

- Joint planning and programming;
- Joint procedures for environmental assessments;
- Jointly arranged environmental monitoring and environmental information system;
- Public information on environmental data and access to environmental data;

- Environmental taxes on the use of natural resources;
- Non-governmental organisations in the field of environment protection operating in the public interest;
- Arrangement of concessions for natural goods.

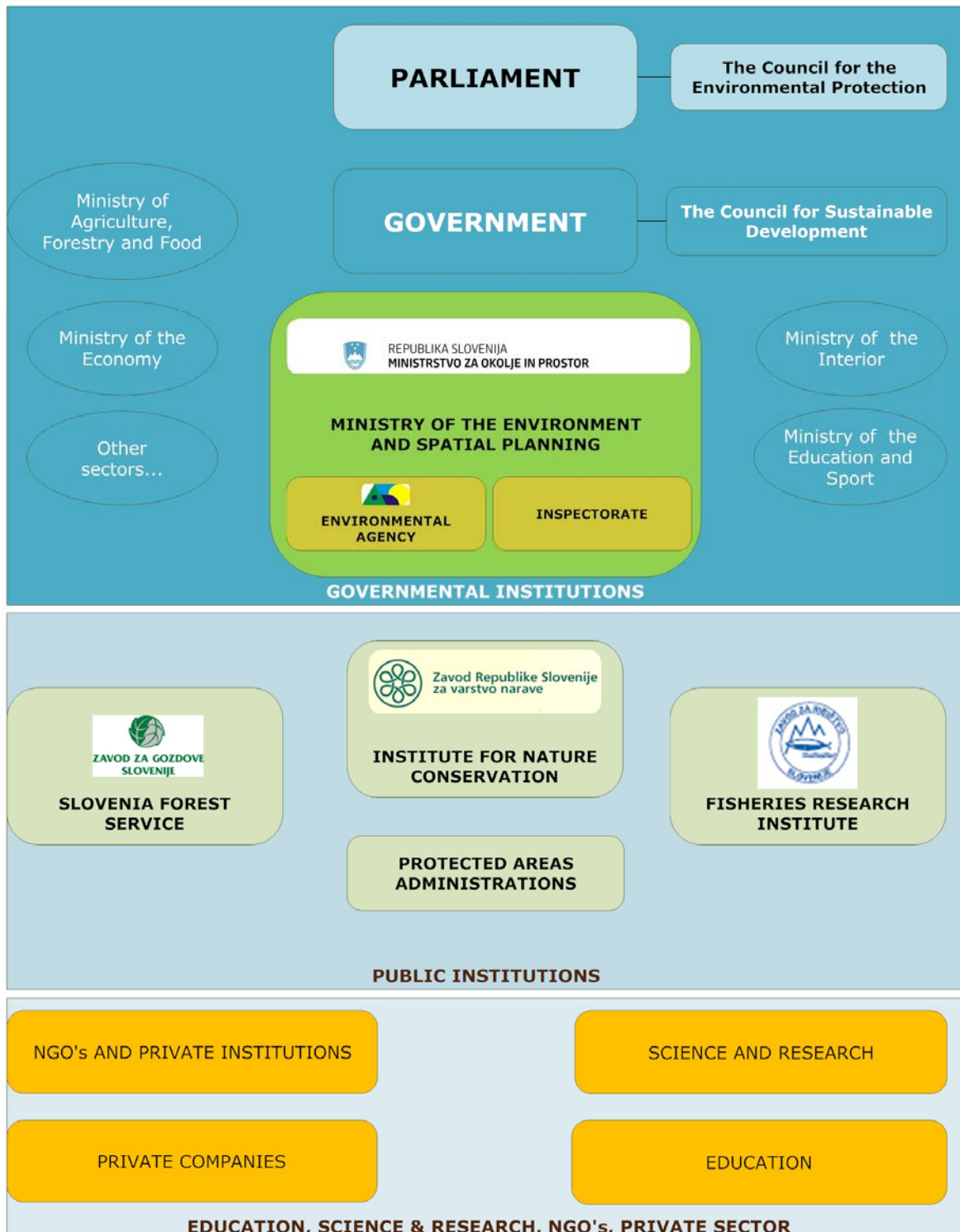


Chart of authorities and organisations implementing conservation tasks at the national level  
 Adopted after: Ministry of the Environment and Spatial Planning, 2006, p. 103  
[http://www.mop.gov.si/fileadmin/mop.gov.si/pageuploads/publikacije/drugo/sistem\\_varstva.pdf](http://www.mop.gov.si/fileadmin/mop.gov.si/pageuploads/publikacije/drugo/sistem_varstva.pdf)

In addition, the Nature Conservation Act provides, as the basic principle of nature protection, the obligation of integration of nature-protection measures in other sectoral fields. Thus it determines that measures for biodiversity conservation and the system of protection of valuable natural features shall be integrated in sectoral fields that regulate the use of natural assets, measures of cultural heritage protection, spatial planning and construction of buildings.

The Nature Conservation Act stipulates that activities affecting nature shall be planned and carried out in such a way that nature is not degraded. Furthermore, in the planning of the use or exploitation of natural assets and in spatial planning, the competent state or local body shall choose the option which meets the criteria of the minimum possible intervention in nature while achieving nearly the same effects, and which does not degrade nature when alternative technical possibilities for carrying out the activity exist. A person responsible for carrying out the activity affecting nature shall act in such a way that his/her intervention in nature is minimal and shall return the natural environment to a close approximation of its original state after the activity has been concluded.

When an activity affecting nature results in the degradation of nature, the person responsible for the activity shall immediately eliminate the adverse effects of his activity and cover all the costs of this elimination.

### *8.3.3. Conservation of biodiversity – In-situ protection*

#### *8.3.3.1. Operational programme and action plan of biodiversity conservation with Natura 2000 Site Management Programme (Operational Programme 2007–2013)*

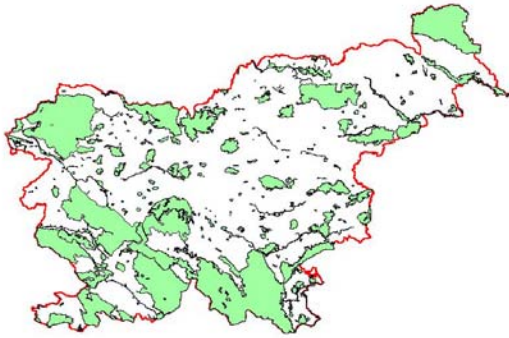

OBJECTIVE: Conservation of high level of biodiversity:

- Conservation or achievement of favourable status of endangered species and habitat types;
- Conservation or achievement of favourable status (scope and quality) of habitats of species and habitat types for which areas important for the conservation of biodiversity (ecologically important areas, Natura 2000 sites) are defined;
- Efficient and harmonised conservation of nature in protected areas by management plans and other measures;
- Improved standards of any treatment of wild animal species.

The implementation of the operational programme takes place through the implementation of the agri-environmental programme and forest management plans (see Chapter III). In the field of water management, the system is established in the framework of the implementation of the Water Framework Directive (preparation of WMPs).

#### a) NATURA 2000

On 29 April 2004, the Government of the Republic of Slovenia determined the Natura 2000 sites in Slovenia by the Decree on special protection areas (Natura 2000 sites); these sites are a part of the ecological network of the European Union. By means of Natura 2000 sites, Slovenia must provide a favourable status of 111 plant and animal species under the Habitats Directive.

SCI (HABITATS DIRECTIVE)	SPA (BIRDS DIRECTIVE)
Number of areas: 260	Number of areas: 26
31.6% of national territory	22.8% of national territory
	
TOTAL: 286 areas – 35.5% of national territory	

Source: Ministry of the Environment and Spatial Planning, 2004

<http://www.natura2000.gov.si/>

Most of these areas are covered in forests, a large share is without vegetation (mostly rocks), 9% of areas are above the tree line, while the share of grasslands is also significant. A total of 25% of the area of Slovenian Natura 2000 sites lies in protected areas (Triglav national park, regional and landscape parks, and reserves and natural monuments). These areas mostly overlap because 60% of areas proposed on the basis of the Habitats Directive are located within the proposed special-protection areas under the Birds Directive.

The European Commission confirmed the areas proposed by Slovenia under the Habitats Directive; in addition, the index of adequacy of the Slovenian proposal was assessed at the expert verification at the Alpine (2005) and continental (2006) bio-geographical seminars. With the proposed network, Slovenia fulfilled the obligations for 73% of species and habitat types from the list in the Habitats Directive and most requirements under the Birds Directive (the European Commission initiated a pre-litigation procedure for the disputable part in 2007).

Area management is set by the **Natura 2000 Site Management Programme (Operational Programme 2007–2013)**, adopted by the Government in 2007, which sets the following for each Natura 2000 site: protection objective, strategic directions and manner of management. This programme prescribes compulsory contents integrated upon the adoption of new plans for individual sectoral plans (e.g. forestry, hunting, fishing, water management).

An important mechanism in consideration of biodiversity conservation is the system of assessment of all plans and some implementing regulations.

**NEAP Objective:** *"Establishment of management of Natura 2000 sites, adoption of management plans and appointment of managers" has generally been achieved, while the upgrading of the network, status monitoring and management are standing tasks requiring implementation.*

A positive side of the Natura 2000 site network is that these sites, species and habitat types receive more attention, not least for the purposes of the clearly defined legal obligations, which the European Commission monitors and for the non-implementation of which it may initiate pre-litigious or litigious procedures. This is an important factor in conserving a considerable part of biodiversity otherwise not covered by EU legislation; the measures may also be positive for the conservation of certain species and habitat types.

Conversely, the priority consideration of the implementation of the EU legislation reduces the emphasis on content not included in this framework.

***b) Protected areas***

Protected areas in Slovenia (status in 2009) are determined as small and large protected areas, and encompass almost 13% of Slovenian territory.

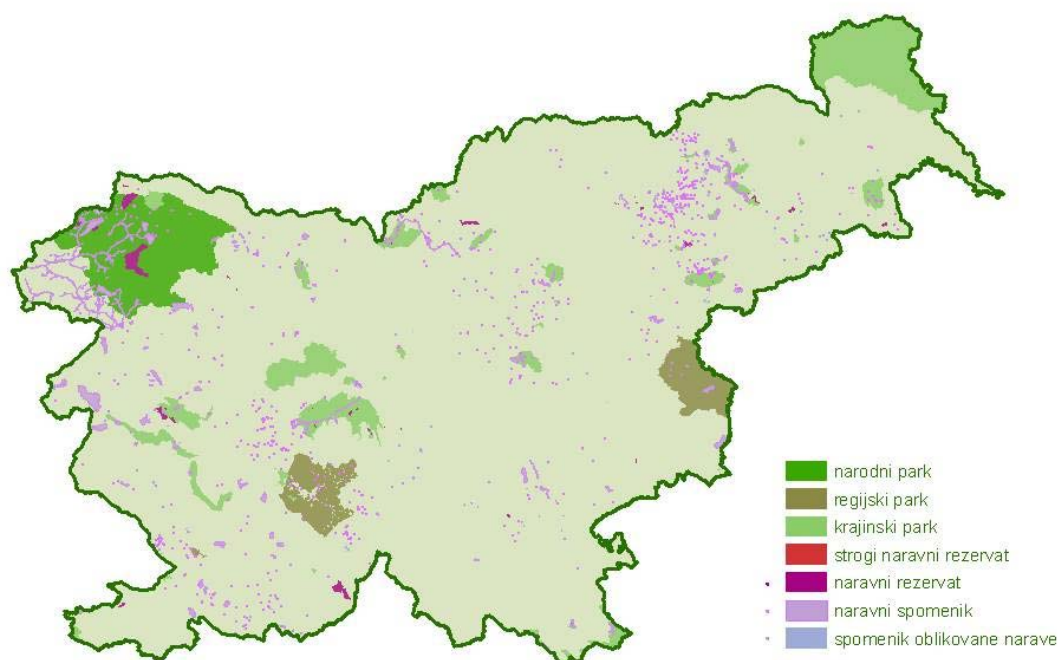
**- Large protected areas**

Protection group	Number	Area (km <sup>2</sup> )	% of national territory
National park	1	83,808	5.68
Regional park	3	43,443	4.13
Landscape park	44	115,111	2.14
<b>Total</b>	<b>46</b>	<b>242,462</b>	<b>11.95</b>

Source: Ministry of the Environment and Spatial Planning, Environmental Agency of the Republic of Slovenia, 2009

**- Small protected areas**

Protection group	Number
Strict nature reserve	1
Nature reserve	56
Natural monument	1191



Source: MESP-EARS, 2009

<http://www.arso.gov.si/narava/zavarovana%20obmo%C4%8Dja/karta/>



(Table inscriptions:

- national park
- regional park
- landscape park
- strict natural reserve
- natural reserve
- natural monument
- monument of designed landscape)

The following tables list only those objectives and directions of NEAP that are directly related to protected areas.

<b>Objectives, measures and directions (NEAP)</b>	<b>Evaluation of implementation</b>
Efficient and harmonised conservation of nature in protected areas through management plans and other measures.	<p>The only protected areas to adopt management plans were Škocjan Caves Regional Park and Škocjanski zatok Nature Reserve. The preparation of management plans (Goriško Landscape Park, Seèovlje Saltpans Landscape Park, Kolpa Landscape Park) and ministry instructions for preparation of management plans for protected areas at the national level is being carried out.</p> <p>Pending the adoption of management plans, managers shall implement their tasks on the basis of provisional management guidelines and annual work programmes.</p> <p>At the end of 2009, the Government adopted the draft Triglav National Park Act, harmonised with the NCA and establishing appropriate foundations for the implementation of management tasks. The Act requires adoption by the National Assembly, which is foreseen for early 2010.</p> <p>In 2009, preparation of a financial and business plan for the Seèovlje Saltpans Landscape Park was initiated within the Dinaric Arc Ecoregion project led by WWF. This plan will serve as a model for other protected areas, which must prepare financial plans as a part of drafting management plans.</p>
Provision of management of existing protected areas – two by 2008, five in total by 2014.	<p>The objective was achieved by 2008. In Strunjan Landscape Park, established at the municipal level in 1990 and at the national level in 2004, management by the Institute of the Republic of Slovenia for Nature Conservation was instituted in 2007 and 2008; since the end of 2008, management has been carried out by the Strunjan Landscape Park Public Institution. Management by a public institution has been also provided in Kolpa Landscape Park, which was established at the municipal level in 1998 and at the national level in 2006.</p>
Establishment of a central unit for protected areas.	The objective has not been achieved because financial resources have not been provided.
Increase share of protected areas within the territory of Slovenia by 5% by 2008.	The objective has not been achieved; the share increased from 11.98% in 2005 to only 12.6%. Establishment of the Kolpa Landscape Park (2006) and Ljubljansko barje Landscape Park (2008).

<b>Objectives, measures and directions (NEAP)</b>	<b>Evaluation of implementation</b>
Increase share of protected areas within the territory of Slovenia by 10% by 2014.	We estimate that this objective could be reached with consensus at the national and local levels for the protection of extensive areas (e.g. Kočevska, Notranjska, Kras). Kamniško-Savinjske Alps Regional Park and Radensko polje Landscape Park are currently in the process of establishment.
Further development of concession management of parks.	The establishment of Radensko polje Landscape Park, for which concession management is foreseen, is under way.
Increase investments in park and similar infrastructure.	In protected areas at the national level, resources are earmarked for investments in infrastructure of this type. Within the budget resources of the Ministry of the Environment and Spatial Planning, investment resources are limited for the implementation of public service of protected area management. Investments in this infrastructure thus mostly come from other sources.
Programme and operational integration of providers in the sense of rationalisation and operational efficiency.	This area is progressing. Evaluation of efficiency of management under the RAPPAM methodology has been implemented. Evaluation of management within the CRP research project under the IUCN-WCPA methodology is underway. There are numerous incentives at the national level for integration of managers of protected areas (training, exchange of experience, unification of approaches).
Gradual strengthening of personnel.	Partly observed.

Slovenia's contribution to the implementation of the Programme of Work on Protected Areas within the CBD is evident from the following table:

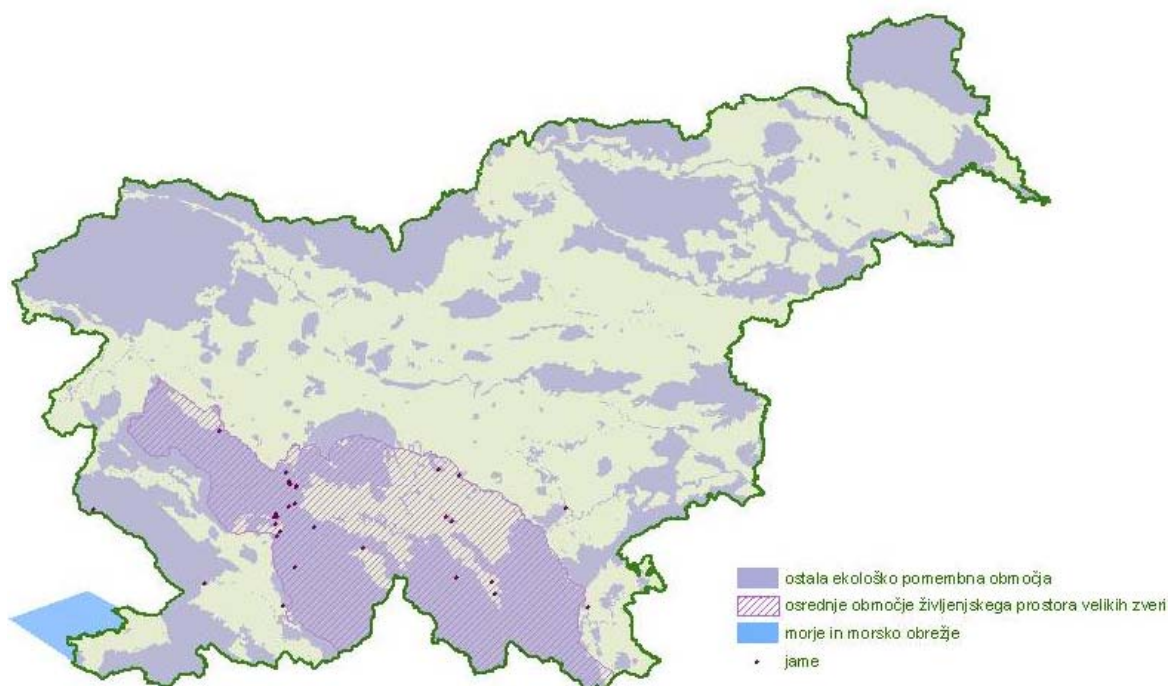
<b>Objective</b>	<b>Evaluation of Slovenia's contribution by activities</b>
Establishment and strengthening of national and regional systems of protected areas.	<ul style="list-style-type: none"> <li>– NEAP set measurable objectives;</li> <li>– Share of protected areas is growing, new protected areas are being established;</li> <li>– Three protected areas related to marine ecosystems (Strunjan Landscape Park, Sečovelje Saltpans Landscape Park and Škocjanski zatok Nature Reserve);</li> <li>– Evaluation of efficiency of management of protected areas in Slovenia is underway;</li> <li>– NEAP defined priority areas for further protection;</li> <li>– Local communities actively cooperate in the establishment of new protected areas.</li> </ul>
Integration of protected areas in broader spatial systems and sectors.	<ul style="list-style-type: none"> <li>– The system of protected areas overlaps with Natura 2000 sites as frameworks for biodiversity conservation, as observed in new protections.</li> </ul>

Objective	Evaluation of Slovenia's contribution by activities
Cross-border cooperation	<ul style="list-style-type: none"> <li>– Most protected areas are situated by the border, so cross-border cooperation is intense, especially in joint projects, as well as through other forms of cooperation (e.g. Goriško Landscape Park as a part of the three-land park and as a part of the IUCN Greenbelt initiative).</li> </ul>
Considerable improvement of planning and management of individual protected areas.	<ul style="list-style-type: none"> <li>– Active preparation of management plans is under way in most protected areas;</li> <li>– Activities targeting improvement of management efficiency are under way (concrete tasks with holders and terms of implementation were defined as part of RAPPAM analysis at the end of 2008).</li> </ul>
Prevention and reduction of negative impacts of key threats.	<ul style="list-style-type: none"> <li>– Threats and pressures on protected areas were defined within RAPPAM analysis;</li> <li>– Many activities are now being implemented, e.g. actions to prevent the spreading of invasive alien species;</li> <li>– In 2008, the Ministry of the Environment and Spatial Planning organised the first training for professional and volunteer supervisors. A permit in accordance with NCA was granted to 186 supervisors (36 in public institutions for protected areas and 150 in the Forestry Service). Nevertheless, nature-conservation supervision in protected areas is not sufficient. Most areas face limited capacity of professional supervisors, which does not allow comprehensive supervision in protected areas.</li> </ul>

c) Ecologically important areas

Under the Nature Conservation Act, an ecologically important area shall be the area of a habitat type, its part or a large ecosystem unit that significantly contributes to biodiversity conservation.

Ecologically important areas are one of the starting points for elaboration of nature-conservation guidelines and a compulsory starting point in spatial planning and use of natural resources.



Source: EARS, 2007 (<http://www.arso.gov.si/narava/>)

(Figure inscriptions:

- other ecologically important areas

- central area of living space of large carnivores

- sea and coast

-caves)

Ecologically important areas are the legal basis for measures for conservation of habitats of endangered plant and animal species. The implementation stresses the attainment of favourable status of species of European concern, while the data for the determination and implementation of measures (e.g. in integration in nature-protection guidelines) for other species are often insufficient, and legal power is limited to the level of recommendation.

#### d) Internationally important areas

Some areas in Slovenia have already gained international importance. That some of these areas are entered in different lists additionally confirms their international importance and strengthens the need for harmonised and comprehensive conservation and protection. The status of internationally important areas for the conservation of biodiversity as well as landscape identity has been granted to the following areas:

- Škocjan Caves Park: UNESCO World Heritage List (1986), MAB (2004), (Ramsar list, 1999);
- Triglav National Park encompassing a broader area of the Julian Alps: MAB (2003), (Diploma of Council of Europe, 2004);
- Sečovlje Saltpans: (Ramsar list, 1993);
- Lake Cerknica and its surroundings including Križna Cave and Rakov Škocjan: (Ramsar list, 2006);
- Kozjansko Nature Park: MAB (confirmed in 2010).

All of these areas are subject to measures for conservation of status within national legislation. Despite the identification of potential areas for new Ramsar-list locations, the preparation of documentation for their listing has been delayed in view of the adopted NEAP 2005 programme.

Areas meeting the conditions for the list of internationally important wetlands and selected as potential locations are the following:

- the Drava from Maribor to Središče ob Dravi;
- the Mura floodplain;
- Ljubljansko barje;
- Krakovski gozd;
- Wetlands by the lower Sava with Dobrava and Jovsi;
- Karst river basin of the Ljubljanica;
- Hinterland of Lake Bohinj;
- Čezsoški prodi and Vrbulje.

In December 2007, the Government of the Republic of Slovenia adopted a strategy for the protection of cultural heritage and valuable natural features in the Republic of Slovenia in accordance with international legal instruments and activities preliminarily proposing areas to be included in MAB and potential locations for the Ramsar list.

Preliminary proposal of priorities for classification in MAB:

- Notranjska Regional Park (in preparation);
- Kamniško Savinjske Alpe Regional Park;
- Mura-Drava-Danube as an international MAB area.

An interministerial working group has been appointed to prepare a three-year action plan for the implementation of the strategy.

#### *8.3.3.2. Conservation of plant and animal species (species conservation) (CH1-2.1.3)*

Besides area protection intended to conserve plant and animal habitats, some species are specially protected right across national territory rather than solely in areas with special nature-conservation status.

##### **a) Endangered plant and animal species**

Endangered species status is the basis for actions, monitoring of species status and effectiveness of measures. The basis for the determination of the status of endangered species is the "red list" of endangered species, which has not been updated in the last decade, although this updating was envisaged by NEAP. This task has not been completed in time because priorities in this period were focused on accession to the EU. In this field, too, we note the lack of coordination of research programmes with needs in the conservation of biodiversity and the lack of financial resources and trained experts.

##### **b) Protected plant and animal species**

With harmonisation with EU legislation, the lists of protected plant and animal species were supplemented in 2004. All internationally important species have now been covered.

#### **DIRECTIONS**

- Preparation and implementation of action programmes for improved status of the most endangered species;
- To mitigate the pressure on endangered species (in particular, pressure caused by recreational activities and the exploitation of species) in critical periods (nesting, spawning, wintering) to the level which allows the maintenance of populations;
- To conserve structures in habitats that are necessary for the conservation of populations of endangered species;
- To conserve and, where appropriate, establish ecological links that facilitate gene exchange among populations;

- To coordinate *in-situ* and *ex-situ* measures for the conservation of endangered species, in particular the breeding of species for reintroduction into the wild and establishment of suitable conditions for their reproduction in nature;
- To prevent introduction of alien species into the natural environment.

### c) Strategy of management of populations of large carnivores and action plans

OBJECTIVE: Maintenance of favourable status of endangered species of large carnivores and reduced conflicts.

The population of large carnivores (brown bear, wolf and lynx) in Slovenia is in a favourable status of conservation. At the same time, the acceptance of the local population of coexistence with large carnivores must be ensured. Large carnivores in Slovenia do not have the status of game but of protected species, so interference with the population is within the competence of the Ministry of the Environment and Spatial Planning. Management of brown bears is carried out in accordance with the Brown Bear Management Strategy in Slovenia (adopted by the Government in 2002), the lynx is not subject to management, while a management strategy for wolves is in the process of adoption.

In the reporting period, Slovenia was active in preparation of a European strategy for large carnivores at the population level (European Commission and the Council of Europe), with the final consultation on the project taking place in Postojna in 2008. Slovenia works together to exchange experience and information with its neighbour Croatia.

### d) Strategy for management of alien invasive species

OBJECTIVE: Conservation of maximally natural composition of biocenosis.

Slovenia did not prepare a strategy for management of alien invasive species in this reporting period, although its adoption was foreseen by NEAP.

Slovenia participated in a number of international projects in this field (e.g. DAISIE), as well as in the preparation of European strategic documents (e.g. Council of Europe, European Commission). From July 2008 to December 2009, the non-governmental organisation Thuja ran a project (Alien invasive species – an overlooked threat) with the intention of raising awareness of the gravity of the problem of invasive alien species.

In preparation for the national strategy of management of alien species, links between sectors (especially agriculture and health) have been established.

#### 8.3.3.3. Operational programme for protection of valuable natural features

##### OBJECTIVES:

- Conservation of characteristics for which natural areas are defined as valuable natural features of a certain type and of all other characteristics to the greatest possible extent;
- Restoration of damaged or destroyed valuable natural features;
- Provision of use of natural resources in a non-threatening manner;
- Provision of *ex-situ* protection of valuable natural features whose conservation in nature, on the site, is not possible.

Conservation of characteristics for which natural areas are defined as valuable natural features of a certain type and of all other characteristics to the greatest possible extent. Natural areas that acquire the status of a valuable natural feature are protected areas with prescribed protection directions and procedures and methods in the case of interventions and activities. Protection directions for protected areas are integrated in nature-protection guidelines, through which the content of nature protection are entered in plans of use of natural resources and spatial planning. Under the Rules on the designation and protection of valuable natural features, the status of valuable natural feature was granted to 6,519 areas in 2004 and additionally to 8,382 caves in 2006. The total number of valuable natural features is 14,901. In 2009, the professional service made a proposal for a partial revision of valuable natural features and for the granting of the status to around 600 caves.

A total of 5 to 15 valuable natural features in the reporting period were annually marked and provided with boards containing information, and guiding and warning signs and messages.

Restoration of damaged or destroyed valuable natural features

In 2009, the challenging restoration of the wetland in Škocjanski zatok near Koper was started. The restoration entered its final stage of implementation in 2009 with the construction of the park infrastructure. Each year, some restoration and rehabilitation activities have been implemented as part of nature-protection actions and interventions; these include rehabilitation of arboreal valuable natural features, rehabilitation of individual river banks and stream beds, restoration of ponds and other still waters, removal of waste from caves, and rehabilitation of nesting areas for white storks.

Some valuable natural features were physically protected by fences, while some caves were closed by mesh doors so to allow bat flights.

Providing use of natural resources without risk to conservation status

In 2003 and again in 2008, a concession for use of the designated valuable natural feature the Postojna and Predjama cave system was granted for a period of 20 years, with long-term and short-term programmes of use determining the nature-protection requirements and restrictions on use. The programme outlines the tasks of the "cave manager", continuous monitoring of impact of use on the cave and immediate actions in the event of negative impacts. A project was started in 2009 to determine types of concession use for 23 caves that would recognise nature-protection importance and sensitivity of caves. In Ajdovska jama, where endangered bat species breed, visits were forbidden in the breeding season.

#### **8.4. Genetic sources, *in-situ* and *ex-situ* protection**

OBJECTIVE:

- **To prevent fragmentation of populations and to promote re-establishment of formerly existing connections between populations to conserve gene flow; to ensure *in-situ* conservation of naturally isolated populations and, where possible, increase the number of specimens in these populations.**
- **To guarantee *ex-situ* protection of indigenous flora and fauna when populations are so small that *in-situ* conservation does not suffice.**

*In-situ* protection is provided by the conservation of living environment and species through the implementation of NEAP. To prevent population fragmentation of species subject to area protection under Natura 2000, detailed rules have been defined as part of the implementation of assessment of acceptability regarding fragmentation of population of these species.

*Ex-situ* protection of indigenous wild plant and animal species is implemented in botanical and zoological gardens, but the situation is not regulated systemically.

*Ex-situ* protection of genetic sources in agriculture and forestry has been regulated (see Chapter III).

<b>Ex-situ Protection</b>			
<b>Objective (2001)</b>	<b>Implementation</b>	<b>Modification/ Status 2009</b>	<b>Directions</b>
<b>To conserve wild animals <i>ex-situ</i> when <i>in-situ</i> conservation is not possible or is seriously threatened.</b>			
<b>To conserve indigenous domestic breeds and varieties for the production of food, materials and medicines, and to conserve the genetic resources of wild relatives of domesticated breeds and varieties.</b>	Breeding of indigenous breeds of domestic animals is encouraged in some protected areas.		Preparation of management plans for all protected areas at national level.

#### DIRECTIONS

- To encourage zoos and botanical gardens, gene banks and collections to maintain species to reintroduce them into the wild when this action leads to satisfactory *in-situ* conservation status for a species;
- Maintenance of animals should take place according to satisfactory standards to guarantee viable specimens;
- To promote the breeding of indigenous varieties of agricultural plants and breeds of domestic animals.

#### **8.5. Sustainable use of biodiversity**

The Nature Conservation Act determines that measures of biodiversity conservation and the system of protection of valuable natural features shall be integrated in sectoral fields that regulate the use of natural assets, measures of cultural-heritage protection, spatial planning and construction of buildings. The conservation of biodiversity concerns, in particular *agriculture, forestry, hunting, fishing and water management* is detailed in the following chapter (Chapter 3).

#### **8.6. Additional literature**

Berginc, M., Kremesec-Jevšenak, J., Vidic, J. 2006. *Sistem varstva narave v Sloveniji*. Ministry of the Environment and Spatial Planning, Ljubljana.

([http://www.mop.gov.si/fileadmin/mop.gov.si/pageuploads/publikacije/drugo/sistem\\_varstva.pdf](http://www.mop.gov.si/fileadmin/mop.gov.si/pageuploads/publikacije/drugo/sistem_varstva.pdf))

Okolje na dlani, MESP-EARS, 2008

<http://nfp-si.eionet.europa.eu/News/NEWS1203675146>



Annex 1:

**Objectives for Conservation of Landscape Diversity**

<b>Objective (2001)</b>	<b>Implementation</b>	<b>Modification/Status 2009</b>	<b>Directions</b>
<p><b>Conservation of traditional extensive and sustainable type of use of land/space, maintaining high level of biodiversity, landscape diversity and landscape cultural identity in parts of protected areas and in outstanding landscape areas.</b></p>	<p>Conservation of high biodiversity level clarified under the objective on "conservation of biodiversity in agricultural landscape".</p> <p>Recent founding acts of protected areas listed under category V of IUCN emphasise the conservation of landscape diversity as the objective of protection.</p>		<p>Preparation of management plans for all protected areas at national level.</p> <p>Determination of landscape area as a recognisable area at national or local levels. (SPRS; PRS 2004) – issue of implementation at local level.</p>
<p><b>Conservation of the existing landscape diversity and of its natural and cultural values.</b></p>	<p>Implementation of CEIA.</p> <p>Promotion of conservation of typical landscape patterns and features in protected areas.</p> <p>Promotion of sustainable development by promoting nature-friendly use of natural resources, handicrafts and tourist guiding in all protected areas at the national level on the basis of the implementation of management plans and annual work programmes.</p>		<p>Preparation of management plans for all protected areas at national level.</p> <p>Definition of characteristics of landscape and landscape diversity important for conservation of biodiversity (Article 35 of NCA).</p> <p>Designation of areas of outstanding landscape as landscape valuable features (NCA).</p> <p>Designation of areas of cultural landscape as immovable cultural heritage (Cultural Heritage Protection Act).</p>
	<p>Implementation of CEIA.</p>		

Annex 2:

<b>Objectives for Conservation of Coastal and Marine Biodiversity</b>			
<b>Objective (2001)</b>	<b>Implementation</b>	<b>Modification/Status 2009</b>	<b>Directions</b>
<b>To reduce industrial, agricultural and urban pollution of water on the coast and in the hinterland so as to attain such water-quality standards that exceptionally diverse (with regard to biotic characteristics) and well-preserved habitat types and habitats of endangered and endemic plant and animal species are not threatened.</b>	Determination of high biodiversity of habitat types or well-preserved habitat types and habitats of endangered plant or animal species through the Regulation on Special Protection Areas (Natura 2000 Sites) and the amended Waters Act (Ur. l. RS, no. 67/02 and 57/08). Adopted Marine Strategy Framework Directive (2008/56/ES).	+ Reference to Chapter 1.	Provisional programme of implementation, preparation of methodologies and provisions on environmental status of the sea, and first assessments of status of the marine environment.
<b>To restore to favourable status degraded habitat types, where possible.</b>	Restoration of Škocjanski zatok and Sečovlje Saltpans.  Initiation of Strunjan Landscape Park management in 2007.	Removal of excess material. Formed relief. Arranged water regime. Conditions re-established for typical plant and animal species. Constructed interpretation infrastructure.	Construction of an information centre.
<b>To prevent introduction of alien species into the natural environment and spreading of introduced alien species into ecologically important areas.</b>			

<b>Objectives for Conservation of Underground Biodiversity</b>			
<b>Objective (2001)</b>	<b>Implementation</b>	<b>Modification/ Status 2009</b>	<b>Directions</b>
<p><b>To maintain subterranean habitat types in ecologically important areas, and the entire subterranean fauna, at a favourable conservation status.</b></p>	<p>Adoption of the Cave Protection Act. Adoption of key secondary legislation on the basis of the Cave Protection Act: Rules on reporting of information on underground caves, Rules on qualifications for autonomously operating in caves, Rules on qualifications of cave guides for guiding in caves which are open to public and arranged for tourist visits, Decree on special protection areas (Natura 2000 sites) determines areas outstanding for conservation of favourable status of underground habitat types. Adoption of the <b>Natura 2000 Site Management Programme (Operational Programme 2007–2013)</b>, which details objectives in these sites. Adoption of the management plan for Škocjan Caves Regional Park. Adoption of the Rules prohibiting activities threatening protected bat species in Ajdovska jama near Nemška vas. Determination of the programme of use of valuable natural features in Postojna and Predjama cave system by 2028 with integrated nature-protection conditions Closure of entrances to some caves important and sensitive in terms of natural protection</p>		<p>Initiation of project granting supervision over caves that are important in terms of nature protection and concessions for the use of caves preventing risks to caves.</p>

**Objectives for Conservation of Agricultural Biodiversity**

<b>Objective (2001)</b>	<b>Implementation</b>	<b>Modification/ Status 2009</b>	<b>Directions</b>
<b>To conserve the surface area of wet and dry grasslands and meadow orchards, in particular in areas of endangered or endemic plant or animal species</b>	<p>Determination of high biodiversity of habitat types or well-preserved habitat types and habitats of endangered plant or animal species through Regulation on Special Protection Areas (Natura 2000 Sites).</p> <p>The Rural Development Programme enables the conservation of grasslands and meadow orchards by agri-environmental measures.</p> <p>Adoption of the Natura 2000 Site Management Programme (Operational Programme 2007–2013), which determines the target scope of agri-environmental measures.</p>		<p>Preparation of management plans for all protected areas at national level, which will contribute to implementation of the Natura 2000 Site Management Programme (Operational Programme 2007–2013).</p> <p>Establishment of new protected areas.</p>
<b>To conserve, and even increase, the current length of hedges, in particular in ecologically important areas</b>	<p>Implementation of acts on protected areas.</p> <p>Determination of high biodiversity of habitat types or well-preserved habitat types and habitats of endangered plant or animal species through Regulation on Special Protection Areas (Natura 2000 Sites).</p> <p>The Rural Development Programme enables the conservation of hedges by agri-environmental measures.</p> <p>Adoption of the Natura 2000 Site Management Programme (Operational Programme 2007–2013), which determines the target scope of hedges.</p> <p>Implementation of measures in protected areas through adopted management plans and annual work plans.</p>		<p>Establishment of new protected areas.</p>

**Objectives for the Conservation of Diversity of Species**

<b>Objective (2001)</b> <b>To maintain all indigenous animal and plant species at favourable status.</b>	<b>Implementation</b>	<b>Modification/Status 2009</b>	<b>Directions</b>
	<p>Conservation of favourable status of threatened indigenous animal and plant species resulting in the adoption of the Decree on protected wild animal species, the Decree on protected wild animal species and the Decree on special protection areas (Natura 2000 areas), providing a legal basis for the implementation of directions.</p> <p>Action programmes prepared at the EU level (for Slovenia) for endangered bird species, their implementation summarised in the <b>Natura 2000 Site Management Programme (Operational Programme 2007–2013)</b>. Temporary protection adopted to reduce pressures on endangered species in the Karst region resulting from increased recreation.</p> <p>Implementation of measures in protected areas through adopted management plans and annual work plans.</p>		<p>Preparation of management plans for all protected areas at national level will contribute to implementation of the Natura 2000 Site Management Programme (Operational Programme 2007–2013) in the next few years.</p>

## CHAPTER III

### SECTORAL AND CROSS-SECTORAL INTEGRATION OR MAINSTREAMING OF BIODIVERSITY CONSIDERATIONS

#### **8.7. Overview of individual activities**

##### *8.7.1. Agriculture (CH1-3.1)*

Because of the high level of conservation of biodiversity, the variety and extent of habitats and the special landscape features in Slovenia, there is a need to further conserve these features. Responsibility for the conservation of these elements is reflected in the proportion of the territory occupied by nature protected areas and protected areas. As much as 47.7% of the national territory is designated as ecologically important area, comprising 202,000 ha of agricultural land. The best method to achieve conservation of these areas is by maintaining the cultivation of agricultural land in an environmentally friendly manner, and by maintaining agricultural activity in marginal and agriculturally less favoured areas, which are at risk of being abandoned and overgrown.

Agriculture plays an important role in the conservation of habitats, biodiversity and landscape diversity. Areas covered by grasslands, areas with low-intensity production and a mosaic structure, and areas with endangered species and rich biodiversity, representing agricultural land of high natural value, cover 300,000 ha of Slovenia's territory. This is around half of all agricultural land, which is mainly located in marginal areas and in agriculturally less favoured areas. Abandonment of farming in these areas and reduction in the area of open space would change the structure of biodiversity and lead to potential loss of the cultural landscape. Thus there is a need to maintain agricultural activity in these areas, ensuring conservation of biodiversity of animals and plants characteristic of agricultural land, and maintaining the diversity and visibility of the Slovene landscape.

One factor that contributes to a high level of biodiversity, conservation of habitats and diversity of nature and landscape is the fragmented structure of agricultural land. Fragmented parcels of land and agricultural parcels maintain the mosaic structure of the landscape, in which semi-natural areas are interspersed with cultivated areas. In areas of high nature value, the fragmented structure of land should be maintained and farmers should be given financial support to help them balance the economic deficit arising from such structural conditions.

With Natura 2000 sites covering as much as 36% of its territory (of which 71% are forests and 30% agricultural land), Slovenia ranks as one of the European countries with the highest proportion of its land made up of Natura 2000 sites. The favourable status of nature and the high level of habitat and biodiversity conservation should be maintained through appropriate strategic guidelines and measures. However, this should not present any major obstacles to optimum exploitation of the economic potential of agriculture in these areas. Numerous rural-development measures, with particular emphasis on agri-environmental measures, which have been implemented successfully for many years within the Slovenian Agricultural and Environmental Programme (2001–2004), the Rural Development Programme 2004–2006 (RDP 04–06) and the Rural Development Programme 2007–2013 (RDP 07–13), represent an important contribution to achieving favourable status of farmland bird populations.

Various measures were implemented within the two priority tasks set out in the Rural Development Programme 2004–2006 (sustainable development of agriculture and rural areas, and economic and social restructuring of agriculture), including the measure regarding compensatory payments for agriculturally less favoured areas, which has contributed to the protection and conservation of cultivated agricultural land and has had a positive impact on maintaining population density in sparsely populated areas, and agri-environmental

measures aimed at reducing the negative effects of agriculture on the environment and at maintaining its current state, which have contributed to a long-term improvement of natural resources in Slovenia. These measures have also had a positive impact on raising the level of education and skills for implementing sustainable farming methods, which support conservation of the favourable status of habitats and biodiversity.

Because of the well-conserved and diverse environment, the favourable status of species and habitats, environmental conditions favourable to organic farming and the low density of population in rural areas, Slovenia has placed at the top of its priorities implementation of the measures proposed under Axis 2 of the Rural Development Programme 2007–2013, which will contribute to sustainable use and maintenance of these conditions. These measures will also reduce threats to the environment posed by point-source intensive farming, maintain agricultural activity in agriculturally less favoured areas, and prevent soil erosion in certain areas. To this end, Slovenia has earmarked almost 53% of its funding from the European Agricultural Fund for Rural Development (EAFRD). The programme does not envisage any direct measures under Axis 2 to achieve the objectives of Natura 2000, the Water Framework Directive and climate-change mitigation; objectives will be implemented through measures with an indirect specific effect.

The habitat and biodiversity status of the Natura 2000 sites in Slovenia indicates good conservation and functionality. Favourable status is also indicated by the fact that a large percentage of national territory is protected in special conservation areas. In the most important parts of the agricultural areas (permanent grassland, meadow orchards, and structural elements of the agricultural landscape) located in the Natura 2000 sites, maintenance of the favourable status of species and habitat types is ensured through permanent cultivation of these areas. The majority of the Natura 2000 sites (94%) overlap agriculturally less favoured areas, where cultivation of agricultural land can be maintained through special measures. The regional model of the Single Payment Scheme, introduced in 2007, also covers payments for grassland, thus providing additional motivation for cultivating land in these areas. To date, no specific requirements for farming in the Natura 2000 sites have been set in Slovenia that would specify land management for individual sites. Accordingly, no measure has been introduced to provide compensation allowances for extra costs and loss of income incurred in performing agricultural activity in these areas. The objectives of Natura 2000 will be achieved through maintaining cultivation in agricultural areas. The status of habitats and biodiversity is monitored by various indicators. The system for monitoring general trends in changes in species populations and habitat conservation enables monitoring of farmland bird populations. The system will also enable monitoring of populations in specific areas (e.g. in areas where certain agri-environmental submeasures are implemented). For several years, populations of endangered bird species in special conservation areas of Natura 2000 sites, and water-bird populations have also been monitored.

The farmland bird population index (Farm Bird Index – FBI), one of the key indicators of biodiversity status at EU level, has shown a downward trend (Figure 7) in the past decade as it has decreased by more than 10% compared with 1996 levels. The data show that the decline in farmland bird populations is due to the specialisation of agriculture, and changes in processes and technologies in agriculture. The most important changes affecting birds are the removal of hedges, land reclamation, increased use of mechanisation, fertilisers and pesticides, simplification of crop rotation, and a decline in the diversity of farming.

Rural areas cover a large part of Slovenia's territory (according to the OECD). Of these areas, 85% are designated less favoured areas, 36% are Natura 2000 sites, and a considerable part of the agricultural area meets the criteria for areas of high nature value. All these areas have certain key issues in common. This means that by applying individual measures to certain areas, we may contribute to the achievement of objectives and to a

favourable state in a number of other areas and at different levels at the same time. The less favoured area measure has a horizontal positive impact on maintaining population density and agricultural activity in a large part of these areas. It contributes to conservation of habitats and ecosystems that have evolved as a result of performance of agricultural activity, and which would disappear if this activity was abandoned. Several other agri-environmental submeasures aimed at promoting extensive production and biodiversity conservation also contribute to the conservation of the status of these areas.

DOPPS – BirdLife Slovenia, in cooperation with the BirdLife International, a global alliance of bird-conservation organisations, has drawn up guidelines on maintaining favourable status of populations of qualifying and other endangered farmland and forest bird species in special conservation areas in Slovenia. These guidelines represent starting points for preparation of appropriate instruments at the national level, in particular, within the opportunities offered by the EU framework programme for 2007–2013, which provides for funding for the Natura 2000 programme from the Structural Funds, rural development programmes and LIFE+, a special financial instrument for the environment. Special emphasis is placed on measures set out in the Rural Development Programme 2007–2013, including measures that are of particular importance to conservation of farmland birds, such as conservation of extensive grassland, special grassland habitats, humid extensive meadows, high-trunk orchards, and the entire group of measures within organic farming.

Since Slovenia has not yet established a joint system for monitoring biodiversity, the information on status is only qualitative. Indications of the status of indicator species or habitat types show that, in areas where agri-environmental measures are applied to the major part of the territory, populations are not declining, and remain within the limits of natural fluctuation.

#### *8.7.1.1. Sustainable use of biodiversity in agriculture*

##### OBJECTIVE:

1. To implement activities that contribute to the cultivation of rural areas and, through the adaptation of technologies, reduce the negative impact of agriculture on water, air and biodiversity;
2. To continue to encourage farmers to use sustainable farming methods, which are environmentally friendly and have a long-term positive impact on environmental conditions;
3. To sustain the ecological and social functions of agriculture, which contribute to maintaining population density and high biodiversity in rural areas, and are based on measures aimed at promoting sustainable development of these areas and at mitigating the effects of climate change.

##### **Measures and activities**

Measures contribute to the conservation and improvement of the status of the environment (soil, water, and air), and conservation of biodiversity and the cultural landscape, thus directly contributing to the achievement of objectives in Natura 2000 sites and areas with high nature value, which are of particular importance to biodiversity conservation. These measures are horizontal and are promoted by agri-environmental payments.

**Specific measures** that are promoted within agri-environmental payments and contribute to achieving the general objectives listed in the table below include the following:

- Organic farming;
- Mountain pasture;
- Mowing of steep meadows;
- Mowing of bumpy meadows;
- Meadow orchards;



- Breeding of indigenous and traditional breeds of domestic animals;
- Production of indigenous and traditional varieties of agricultural plants;
- Sustainable breeding of domestic animals;
- Maintaining extensive grasslands
- Breeding of domestic animals in the central areas of appearance of large carnivores;
- Conservation of special grassland habitats;
- Conservation of grassland habitats of butterflies;
- Conservation of meadows overgrown with birch trees and fern undergrowth;
- Bird conservation in humid extensive meadows in Natura 2000 sites.

#### General objectives and indicators

OBJECTIVES	BASELINE INDICATORS	VALUES	
		Baseline	Target (2013)
Halting biodiversity loss	Population of indicator bird species* (index, 2007=100)	100	
Conservation of systems with high nature value	Agricultural areas with high nature value	444,658 ha	
Conservation of Natura 2000 sites	Overgrown agricultural land in Natura 2000 sites	10,500 ha	9,000 ha
Improvement in water quality	Application of nutrients to land	129 kg/ha	115 kg/ha
	Gross nutrient balance – surplus of nitrogen	40 kg/ha	≤ 40 kg/ha
Eliminating marginalisation and land-use abandonment	Share of utilised agricultural area (UAA) in the total area	29.5%	30%
	Overgrown agricultural land	25,200 ha	20,000 ha
Reduction of soil erosion	Annual amount of soil eroded	0.874 t/ha	0.825 t/ha
Maintaining soil quality	Agricultural areas devoted to organic production	26,831 ha	64,000 ha**
Climate-change mitigation	Areas devoted to renewable energy production	2,100 ha	3,000 ha
	Renewable energy production from forestry	449 kToe	Increase
	Renewable energy production from agriculture	9.9 kToe	Increase
	Greenhouse-gas emissions from agriculture (CO <sub>2</sub> eq)	1,996,000 t	1,850,000 t
	Ammonia releases	20,600 t/year	20,400 t/year

\* Slovenia has been monitoring farmland bird populations since 2007

\*\* Utilised agricultural areas included in the control of organic farming

#### 8.7.1.2. Support to breeders of indigenous breeds of domestic animals

From 1999 to 2005, when granting subsidies to breeders of indigenous breeds of domestic animals was within the competence of the Agency of the Republic of Slovenia for Agricultural Markets and Rural Development, breeders of Slovene indigenous breeds had a contract with the Department of Zootechnology of the Biotechnical Faculty under which they were entitled to compensation for loss of income. Each breeder whose animals were included in the conservation programme had a contract for a specific number of animals in the gene bank with the list of animals. Breeders of Slovene indigenous breeds of cattle, sheep and goat could obtain investment grants to set up infrastructure for breeding indigenous breeds of domestic animals.

Data from the agency shows the following number of applications for breeding indigenous and traditional breeds of domestic animals granted in 2008:

Number of applications for breeding indigenous and traditional breeds of domestic animals in 2008

Type	Cattle	Horses	Pigs	Goats	Sheep	Hens
No. of holdings/ No. of animals	226/829	860/3207	63/566	17/288	183/7693	2/360

In 2008, one-off support was allocated to breeders of Cika breeding bulls from the funds of the gene bank. Breeders of each selected and approved breeding bull were entitled to this support, which was intended to enable inclusion of Cika breeding bulls in the newly established gene bank for Cika cattle. From 30 breeders', 32 breeding bulls were selected.

#### Objectives for sustainable use of biodiversity in agriculture

Objective (2001)	Measure	Indicator	Modification/Status 2009	Strategic Directions
Application of ecological and social functions of agriculture, which contribute to conservation of rural areas and high biodiversity in these areas, and are based on sustainable forms of agriculture and sustainable development of these areas.	Support to breeders of indigenous breeds of domestic animals.	Number of animals for which breeders have received support.	Conservation of breeding of indigenous breeds of domestic animals.	Offering financial incentives to promote the breeding of indigenous breeds of domestic animals, in particular breeds categorised as critically endangered, endangered and low risk.

#### STRATEGIC DIRECTIONS:

- To meet objectives concerning conservation of biological and landscape diversity through application of appropriate agricultural policy instruments;
- To promote targeted agri-environmental measures that emphasise the principles of conservation of plant and animal species in agricultural activities and ensure sustainable agriculture; to regularly monitor the effectiveness of these measures through specific biodiversity indicators;
- To enforce cross-compliance requirements with the aim of reducing the threat of pollution caused by chemical and mineral substances, and other adverse effects on biodiversity and landscape diversity;
- To raise the awareness of all farmers and turn them into stewards of the environment and biological and landscape diversity, with emphasis on appropriate pesticide management;
- To introduce, through legislation, and promote labelling and marketing of agricultural products produced in a manner, and in areas, significantly contributing to conservation of biodiversity;
- To reduce emissions from point sources (e.g. livestock farms) and diffuse sources (e.g. intensive agriculture);
- To promote and ensure the viability of sustainable plant cultivation and animal breeding through selection of varieties and breeds that are adapted to the natural conditions, and conserve the ecosystems of endangered wild species; to support the breeding/cultivation of less productive indigenous plant species and breeds of domestic animals;

- To coordinate agricultural policy with efforts to conserve or improve the status of endangered plant and animal species and their habitats;
- To promote and support less intensive agricultural practices in areas of high nature value, especially in protected areas;
- To limit all activities that are unfavourable for conservation of biodiversity (agricultural reclamation, agricultural hydraulics, land consolidation, etc.) and do not contribute to achieving the objectives of agricultural policy.

8.7.1.3. Genetic resources in agriculture

Objective (2001)	Measure	Indicator	Modification/Status 2009	Strategic Directions
Expansion of sustainable agricultural practice based on indigenous genetic resources of plant varieties and domestic animal breeds.	<p>Support to production of indigenous agricultural plant varieties and rearing of domestic animal breeds.</p> <p>Monitoring of indigenous and traditional breeds of domestic animals in Slovenia.</p> <p>- Register of Breeds with Zootechnical Assessment (introduced in 2003);</p>	<p>- Number of agricultural holdings applying the measure;</p> <p>- Surface area for production of indigenous varieties;</p> <p>- Number of animals for which breeders received support;</p> <p>- Number of users (farmers) producing indigenous varieties or rearing domestic breeds;</p> <p>- Number of registered animals by breed (indigenous and traditional breeds);</p> <p>Drafting of annual reports on all indigenous and traditional breeds.</p> <p>Number of registered</p>	<p>- Data from record of measures in agri-environmental programme;</p> <p>- Conservation of breeding of indigenous breeds of domestic animals;</p> <p>- Lack of indigenous varieties of certain agricultural plant groups (cereals), which adversely affects programme implementation;</p> <p>- Expert reports for 12 indigenous and 10 traditional breeds of domestic animals;</p> <p>- Zootechnical review for 48 domestic animal breeds;</p> <p>Drafted expert reports for 12 indigenous and 10 traditional breeds of</p>	<p>- Increase in conservation of plant genetic resources on agricultural holdings (on farm conservation);</p> <p>- Increase in number of indigenous varieties eligible for support;</p> <p>- Adequate financial incentives for rearing indigenous breeds of domestic animals, in particular breeds categorised as critically endangered, endangered and low risk;</p> <p>- Gradual inclusion of all indigenous and traditional breeds of domestic animals in expert reports;</p> <p>- Detailed zootechnical review of already registered breeds of domestic animals and addition of new breeds;</p> <p>Gradual inclusion of all indigenous and traditional breeds of domestic animals in expert reports.</p> <p>Detailed zootechnical</p>

Objective (2001)	Measure	Indicator	Modification/Status 2009	Strategic Directions
		animals by breed.	domestic animals. - Zootechnical review for 48 domestic animal breeds;	review of already registered breeds of domestic animals and addition of new breeds;
Conservation of the genetic potential of indigenous plant varieties and domestic animal breeds,	Expeditions and development of inventory of genetic resources, evaluation and propagation of seed material of accessions under gene-bank programme.  Setting up tissue depository.	Number of collected genetic resources, number of restored accessions, number of evaluated (characterisation and evaluation) accessions.  Number of samples by domestic animal breed.	Data from the Slovenian Plant Gene Bank.  Tissue depository for 27 domestic animal breeds.	Support of gene bank for characterisation and evaluation, propagation and conservation of accessions of genetic resources.  Tissue depository supplemented with new samples.
Sustainable use of indigenous genetic resources for food and agriculture.	Programme for cultivating varieties or propagating local populations from genetic resources in <i>ex-situ</i> collections.	Number of cultivated or propagated local populations from resources in the gene bank.	Currently there is no programme of this kind; the plant gene bank lacks funds for promotion of use of plant genetic resources.	Multi-year (permanent) programme supporting use of plant genetic resources for cultivating plant varieties and assisting in preparation of an adequate quantity of seed material of accessions from <i>ex-situ</i> and <i>in-vivo</i> collections of genetic resources.

A new zootechnical document for monitoring biodiversity in livestock farming was introduced in 2003: the **Register of Breeds with Zootechnical Assessment**. It is updated every December. The register comprises the following data on domestic animals by species and breed:

- Name of breed;
- Basic data (stock, herdbook);
- *In-situ* gene bank;
- *Ex-situ* gene bank;
- Data from international databases;
- Breeding programme;
- Assessment of special genetic value for conservation of animal genetic resources;
- Zootechnical assessment and action.

To conserve biodiversity in livestock farming, proposals for expert and other measures by breed are drawn up every year (in the last four months of a year) on the basis of information from the Register of Breeds, the zootechnical assessment of the breed, use and risk status. In 2003, data on cattle (6 breeds), sheep (6 breeds), goat (4 breeds) and pigs (7 breeds) were collected and entered into the register. Over the years, the register has been supplemented with data on new breeds. In 2008, the following data were included in the register: 11 breeds of cattle, 11 breeds of horses, 7 breeds of pigs, 6 breeds of sheep, 4 breeds of goat, 7 breeds of hens, 1 dog breed and 1 breed of bee – in total 48 breeds (13 indigenous, 16 traditional and 19 non-indigenous breeds). The register has also been supplemented with completely new information stemming from expert work with individual species and breeds of domestic animals. Since 2006, samples have been collected for the tissue depository, in particular samples of indigenous and traditional breeds; in 2004 and 2005 breeding programmes were approved and since the introduction of EFABIS, entry of individual species and breeds of domestic animals in this international database has been specified in the register. Detailed information available for each breed up to 2008 is presented in individual on-line registers with zootechnical assessments: [http://www.bfro.uni-lj.si/Kat\\_center/genska\\_bank/pasme.htm](http://www.bfro.uni-lj.si/Kat_center/genska_bank/pasme.htm).

Assessment of stock of purebred Slovenian indigenous breeds of domestic animals in 2003 and 2008

Breed/Year	2003	2008
Lipizzan horse	630	782
Slovenian cold-blooded horse	1,120	2,500
Posavje horse	700	800
Cika cattle	686	1890
Krško polje pig	350	599
Jezersko-Solčava sheep	19,200	17,000
Bovec sheep	3,600	3,500
Bela krajina pramenka	680	850
Istrian pramenka – Istrijanka	1,200	1,150
Drežnica goat	550	600
Styrian hen – Štajerka	1,200	1,000
Carniolan bee (no. of honeybee families)	157,000	133,983
Karst shepherd	-	600

The data show that all Slovenian indigenous breeds have been conserved and the stock of the majority of breeds has increased.

Review of most important zootechnical assessments by breed groups in Slovenia's agriculture in 2008

Breed group	No. of breeds	Breeding programme	Basic zootechnical characteris.	Gene bank	Tissue depository	Breeding value	Zootechnical assessment and action
Indigenous	13	12 92.3%	13 100%	9 69.2	13 100%	5 38.5%	13 100%
Traditional	16	16 100%	16 100%	-	7 43.8%	13 81.25%	16 100%
Non-indigenous	19	13 68.4%	19 100%	-	7 36.8%	6 31.6%	19 100%
Total	48	41 85.4%	48 100%	9 18.8%	27 56.3%	24 50%	48 100%

Analysis of the most important zootechnical assessments of breeds reared in Slovenia and entered in the Register of Breeds with Zootechnical Assessment revealed a satisfactory situation. Basic zootechnical characterisation is known for all breeds, though breeding programmes for seven breeds have not yet been approved and adopted. The use of breeds and implementation of breeding measures are two key requirements for effective conservation of animal genetic resources. The *in-situ* gene bank comprises 9 indigenous breeds and the tissue depository 27 breeds. Breeding value is regularly calculated for 24 breeds (50.0%). Zootechnical assessments and measures are adopted for 48 breeds.

Pursuant to the Council Regulation (EC) No 510/2006, four traditional cheeses are protected on the transitional national level in Slovenia (Nanoški sir – Nanos cheese, Bovški sir – Bovec cheese, Mohant – Mohant cheese and Tolminc – Tolmin cheese). However, only two are available on the wider Slovenian market (Nanoški sir and Tolminc). Bovški sir is made from the milk of the Bovec sheep, an indigenous breed of domestic animal, while the other three are made from milk of traditional breeds: Nanoški sir and Tolminc are made from the milk of brown breed cows and Mohant is made from the milk of the Simmental breed. A small quantity of Mohant is made from the milk of the Cika breed, which is also indigenous.

Prekmurska šunka, Prleška tünka, Šebreljski želodec and Zgornjesavinjski želodec are typical local protected meat products made from the meat of traditional pig breeds.

Surveys and studies have shown that Slovenian consumers still lack knowledge of food symbols. Since demand for these products is a key element for the functioning of quality schemes and increasing the interest of producers of protected agricultural products, more will have to be invested in the future in publicity, promotion and marketing of these protected products or foodstuffs.

The selection of protected Slovenian traditional foodstuffs on the market is still modest. Products in supermarkets that have been granted protection in Slovenia and those for which applications for protection on the European Union market are being processed include Kraški pršut (Karst prosciutto), Nanoški sir and Štajersko prekmursko bučno olje (Štajerska Prekmurje pumpkin seed oil). Unfortunately, retailers do not recognise the special characteristics and higher value of these products, and place them on shelves next to similar products from other brands. Products with guaranteed origin, related to Slovenian cultural heritage, tradition, and typical local production and processing, are definitely of higher value for buyers than similar products from mass industrial production.

Areas where GMOs are not released into the environment include all Natura 2000 sites. In addition, cultivation of GMOs is banned in newly established protected areas.

#### 8.7.1.4. International cooperation on biodiversity in livestock farming

In the field of biodiversity conservation in livestock farming, Slovenia primarily cooperates with the following international organisations: FAO (Food and Agriculture Organization), ERF (European Regional Focal Point), EAAP (European Association for Animal Production), DAGENE (International Association for the Conservation of Animal Breeds in the Danubian Region), SAVE (Safeguard for Agricultural Varieties in Europe). A report on the current situation and activities with respect to animal genetic resources in Slovenian agriculture is annually submitted to ERF and published on its website.

(<http://www.rfp-europe.org/template02.php?lang=EN&id=1703>).

Until 2006, data on indigenous and other domestic animals in Slovenia were presented in DAD IS, an international database. Pursuant to the global report on the state of animal genetic resources, these data were later transferred to a new global database EFABIS. Each country is responsible for updating its own information: ([http://efabis.si/bfro.uni-lj.si/cgi-bin/EfabisWeb.cgi?sid=1335516a322494443f39d644d9e2bec0.reportsreport12\\_50000218](http://efabis.si/bfro.uni-lj.si/cgi-bin/EfabisWeb.cgi?sid=1335516a322494443f39d644d9e2bec0.reportsreport12_50000218)).

**Interlaken Declaration:** At the First International Technical Conference on Animal Genetic Resources for Food and Agriculture, organised in Interlaken between 1 and 7 September 2007 by the FAO Commission on Genetic Resources for Food and Agriculture (CGRFA), countries adopted binding documents that are at the same time a global agreement, recommendations and guidelines for future conservation of animal genetic resources in agriculture. The Interlaken Declaration was adopted at the conference. On the website of the Animal Science Department, Biotechnical Faculty of the University of Ljubljana, the key issues of the Interlaken Declaration are highlighted and explained primarily with relevance to Slovenia. The Global Plan of Action for Animal Genetic Resources served as a basis for assessment and evaluation of Slovenia's compliance with strategic priorities. This document is a guide to conservation of animal genetic resources in agriculture ([http://www.bfro.uni-lj.si/Kat\\_center/genska\\_bank/pub/porocilo/2007\\_Interlaken\\_deklaracija\\_pot.pdf](http://www.bfro.uni-lj.si/Kat_center/genska_bank/pub/porocilo/2007_Interlaken_deklaracija_pot.pdf)).

#### STRATEGIC DIRECTIONS

- To characterise (including taxonomic identification), evaluate and document genetic resources of plant varieties and animal breeds. In addition to biological characteristics, this evaluation should include agronomic characterisation of agricultural plants and their related wild species, as well as physiological and nutritional characterisation of respective animal breeds;
- To effectively manage the inventory and central register of Slovenian genetic resources (*in situ*, *ex situ*);
- To draft and implement a national programme on conservation and sustainable use of genetic resources under the umbrella of biodiversity conservation, and for the potential use of genetic resources for food, climate (adaptation of plants to climate change) and other purposes;
- To prepare programmes for the operation of agricultural gene banks used to conserve genetic resources *ex situ*, *in situ* and *in vivo* for food and agriculture;
- To integrate plant genetic resources from public records into a multifaceted exchange system to facilitate access and dedicated use of these resources;
- To promote breeding/cultivation and agricultural use of commercially effective indigenous plant varieties and domestic animal breeds;
- To promote the development of trademarks for agricultural products of indigenous domestic animal breeds and plant varieties, and sales organisation for these products;
- To strengthen cooperation, including exchange of information between scientists, experts, competent ministries, farmers and consumers, in the management of the policy on genetic resources for food and agriculture (establishment of a council for genetic resources);
- To provide suitable legislation for introduction of control mechanisms for the use of GMOs and their release into the environment, for their gradual introduction on a case-by-case basis, taking into consideration the precautionary principle;



- To guarantee transparent procedures for granting consent or authorisation to use and release GMOs supported by suitable institutional infrastructure at national level and by competent professional staff;
- To strengthen international cooperation, including exchange of information and genetic material, according to the principle of national powers and national responsibility for the protection of natural genetic resources.

### 8.7.2. Forestry

Conservation of biodiversity is one of the main targets of sustainable and close-to-nature management of forests in Slovenia. Forestry is a good example of sectoral mainstreaming of biodiversity considerations. In addition to the Forest Act, which among other things stipulates that forest habitats of indigenous plants and animals must be preserved or restored in accordance with forest-management plans, the Resolution on the National Forest Programme (NFP), which was adopted by the National Assembly of the Republic of Slovenia in 2007, defines the key objectives for the conservation of biodiversity in forests. Biodiversity issues were, of course, also tackled in the NFP of 1996. In forestry, the Biodiversity Conservation Strategy of Slovenia to a significant extent took into account guidelines from the NFP and vice versa, directions from the strategy were taken into account in the revised NFP.

The NFP defines the objectives of biodiversity conservation at the level of ecosystems, species and genes. The main guidelines for achieving these objectives include:

#### 1. Ecosystem level:

- Forests must be managed in a sustainable and close-to-nature manner to preserve or promote the natural composition of plant and animal species;
- The natural composition of tree species must be provided by natural regeneration of stands, and special attention must be paid to continuous harmonisation of plant and animal components in forests;
- In case of the renewal of stands with planting, preference must be given to domestic species and local provenances adapted to a site;
- Favourable conservation status of rare and vulnerable habitat types in forests, including habitat types and species in Natura 2000 sites, must be maintained on the basis of suitable guidelines in forest-management plans or by suitable management focusing on:
  - Diverse forest structure in different age phases,
  - An adequate quantity of decaying wood mass,
  - Typical composition of biocenosis without non-indigenous species and GMOs,
  - The surface area of 11 forest habitat types of European importance;
- The network of forest reserves must be preserved and suitably expanded;
- The forest classification system must be revised and harmonised to be useful for managing and monitoring forest development and for international comparison at the level of habitat types; monitoring of the conservation status of forest habitat types must be provided;
- Publicity and awareness raising on the significance of biodiversity in forests must be improved;
- Surface area covered by forests and small forest components, including individual trees, where there is a lack of them in the landscape, must be enlarged exclusively for the purpose of increasing biodiversity.

## 2. Species level:

- Within forest planning and management, special attention must be paid to indigenous tree species – key species, in particular accompanying species and minority species of forest communities that are endangered due to the environment or their specific ecological characteristics, such as Wild Service Tree (*Sorbus torminalis*), True Service Tree (*Sorbus domestica*), Yew (*Taxus baccata*), Whitebeam (*Sorbus aria*), Rowan (*Sorbus aucuparia*), Elm, Maple, Ash);
  - Where forests are habitats of endangered plant and animal species, emphasis must be placed primarily on the conservation of:
    - the size of a suitable forest habitat in areas where species occur,
    - the specific forest structures as habitats of species by planning forest-tending measures in line with the ecological requirements of species,
    - natural composition of biocenosis without non-indigenous plant and animal species or subspecies and biotechnologically modified organisms,
    - unpolluted air, water and soil, and, in case of pollution, their improvement,
    - unfragmented habitats of species or connecting fragmented parts of habitats of species and eliminating factors with an adverse effect on the favourable status of species;
- For conservation of a specific forest structure, special attention must be paid to forest edges, wetlands and small provisional but key habitats or habitat trees, including decaying wood, and co-financing of suitable measures must be provided
- In habitats of endangered animal species sensitive to disturbances, quiet zones must be set up or movement of visitors limited to paths;
- In all forests, recreational activities must be directed to areas where they do not substantially disturb forest animals, and forest works must be adjusted to the lives of forest animals.

Directions for the conservation of biodiversity in forests based on the Government's special programme, the **Natura 2000 Site Management Programme (Operational Programme 2007–2013)**, and measures for achieving a favourable conservation status of species targeted by Natura 2000 sites are included in forest-management plans prepared for all forests, irrespective of ownership, with public funds on a regular basis. Nature-conservation guidelines drafted by the Institute of the Republic of Slovenia for Nature Conservation and regulations on forest conservation, where biodiversity is key to maintaining the biotic balance of forests, are taken into consideration. Regulations on forests stipulate that forest owners must manage their forests in accordance with forest-management plans, and the state assists them by cofinancing investment.

The status of forests is periodically reviewed for the purpose of forest-management plans, or basic data important for biodiversity of forests at the ecosystem level are monitored. Biodiversity at the species level is monitored by specialised organisations assisted by the state.

When Slovenia joined the European Union, the share of forests in areas under protection increased to 50%, because large forest areas met the criteria for habitat types of Community interest. Strategic directions for biodiversity conservation are implemented in these forests with special care. Tree composition, structure, development phases, young growth, volume of decaying wood, browsing and other damage caused by game, quiet zones and number of species with a favourable status in Natura 2000 sites are the main conservation indicators systematically monitored.

Data from the system for status monitoring and forest development show that the tree composition is slowly approaching the natural composition and that the volume of decaying wood in forests is in general adequate with the exception of areas inhabited by species requiring larger volumes of decaying wood. Due to relatively less intensive felling in the past

two decades, the share of young growth is very small but the share of older development phases is big. In some parts, herbivorous cloven-hoofed game browses on young growth to an extent that prevents natural regeneration of stands with a natural composition of tree species. Forestry and hunting have been linked to tackle this problem, but measures are still not adequate. Progress has been achieved in defining quiet zones in forests where motor vehicles are prohibited due to wild animals.

With respect to maintaining a favourable conservation status in Natura 2000 sites, forest owners to date have not experienced any major restrictions in forest management with the exception of decaying wood and habitat trees, and difficulties with the construction of forest roads. To date, they have not often requested compensation on the grounds of restrictions in areas under protection, but these claims can be expected in the future when more intensive management of forests is foreseen.

The Forest Act prescribes measures for biodiversity conservation, of which the following two are of special importance: a ban on large-scale clearcutting and a ban on the use of non-indigenous species for reforestation.

## STRATEGIC DIRECTIONS

- To effectively implement all guidelines of the Programme for the Development of Forests in Slovenia that contribute to the conservation of biodiversity, in particular:
  - To conserve and restore plant and animal diversity, and to protect rare or endangered forest species and ecosystems; to conserve and establish a suitable living environment for all indigenous species of wild animals;
  - To bring the tree composition and structure even closer to the natural status; to carry out a gradual biological stabilisation (by the introduction of natural tree species) in biologically and ecologically labile stands (for example, in fir-dominated stands);
  - To regenerate forests naturally and over small areas; renewal by planting is an exceptional measure taken when it is impossible to regenerate forests naturally; when stands are renewed by planting, it is vital that the propagating material is of a species suitable for the selected site and of suitable provenance;
  - To designate habitats of particular importance for animals or areas important for conservation of biodiversity in a forest and landscape; to adapt forest management to their role;
  - To guarantee the conservation and development of aquatic ecosystems in the forest environment;
  - To ensure complete protection of forest reserves (legal protection and purchase if necessary);
  - To ensure complete protection of forests in IUCN Protected Area Categories I, II;
  - To surrender ecologically very vulnerable stands, growing in extreme conditions, to natural development (except for urgent sustainable restoration measures);
  - To exclude small forest areas (eco-cells) and individual trees to conserve and increase biodiversity of forests;
  - To conserve, establish and create forest edges and tree groups, individual trees, riparian forest vegetation, wind shelterbelts and tree boundaries outside forests;
  - To apply exclusively ecologically sound technologies in tree felling (skidding of wood) and to only build absolutely necessary and environmentally friendly forest roads;
  - To prevent exploitation of forests that would threaten their sustainable development and functions;
- To take into account forest functions, in particular ecological functions, in spatial planning, planning of activities that affect the physical environment and in development of activities in areas defined in forest-management plans;
- To establish, as part of the Slovenian forest gene bank, a network of forest gene reserves based on expert criteria and on appropriate characterisation of and documentation on indigenous populations of forest genetic resources.

### 8.7.3. Hunting

Pursuant to the Act amending the Game and Hunting Act (Ur. I. RS, no. 17/2008), certain measures specified in the table below have already been adopted. In 2007, the Rules on the adoption of long-term plans of hunting-management areas in the Republic of Slovenia 2007–2016 (Ur. I. RS, no. 99/2007) were adopted. In agreement with the Ministry of the Environment and Spatial Planning, on the basis of these Rules, the Ministry of Agriculture, Forestry and Food adopted long-term hunting management plans for hunting-management areas 2007–2016.

Given the objective defined in 2001, further efforts will be necessary to achieve the objective of conserving favourable status of game species and their habitats and, where necessary, improving this status by applying directions regarding the development of game populations.

#### Objectives for Sustainable Use of Biodiversity in Hunting

Objective (2001)	Measure	Indicator	Modification/Status 2009	Strategic Directions
To maintain species and habitat types at a favourable status and, where necessary, to improve their status by directing the development of game populations.	<p>Concession award for sustainable game management.</p> <p>Three-stage planning of game management (long-term strategic planning at the level of hunting-management planning, annual planning at the level of hunting-management area and implementing annual planning at the hunting-ground level.</p>	<p>Numerical status.</p> <p>Frequency of damage caused by game in hunting and non-hunting areas.</p>	<p>Favourable numerical status.</p> <p>Noticeable over-population in certain species.</p> <p>Number of damage events is slightly increasing.</p> <p>Hunting information system.</p>	<p>To monitor development trends in game population.</p> <p>To reduce the occurrence of damage events.</p>

#### STRATEGIC DIRECTIONS

- To address the issue of game and its living environment in an integrated manner;
- To draw up game-management plans with regard to the status of game, its habitats, the load-bearing capacity of the environment and ecological processes in ecosystems, in line with sustainable use and development of forests;

- To incorporate nature-protection objectives into game-management plans and to guarantee their harmonisation with guidelines for conservation of endangered species and threatened habitat types;
- To promote the participation of public forestry services and hunting organisations in the spatial-planning process and the implementation of activities in rural areas, in particular during construction of infrastructure, to ensure conservation of habitats of game and other wild animals;
- To draw up directions for all activities, in particular in the field of agriculture, forestry and water management, to conserve the habitats of game and other wild animals;
- To perform activities at a time of year when game is not overly disturbed;
- To implement game breeding and hunting measures to conserve and improve habitats of game and other wild animals, while gradually reducing the intensity of game feeding;
- To gradually cease repopulation of hunted species in ecologically important areas and to take into account local genetic origin in the repopulation of game in other areas;
- To reduce breeding of hunted bird species for the purpose of sport hunting;
- To reduce the size of pens set up for hunting purposes.

#### *8.7.4. Fisheries*

Conservation and sustainable management of fishery resources are among the key objectives of fisheries policy in Slovenia. These objectives are pursued on the basis of two umbrella acts regulating marine fisheries and freshwater fisheries respectively (Marine Fisheries Act of 2006 and Freshwater Fisheries Act of 2006).

The Common Fisheries Policy (CFP) of the European Union in individual fields endorses the attainment of the objectives of Slovenia's fisheries policy. The CFP comprehensively regulates only marine fisheries, whereas freshwater fisheries and aquaculture are to a large extent in the hands of Member States (at the EU level, there is only the obligation to submit data on aquaculture).

The most important document for the conservation of biodiversity in the field of **marine fisheries** is Council Regulation (EC) No 1967/2006 concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea which defines the minimum sizes of marine organisms, requirements relating to the characteristics of fishing gear and conditions for attachments to and rigging of trawl nets. The regulation is directly and fully applicable in Slovenia. In the Marine Fisheries Management Plan for waters under its jurisdiction, Slovenia defined two potential derogations from the provisions of this regulation (in relation to the drop of surrounding nets and a transitional derogation regarding the mesh size of bottom trawl nets). The subject matter of this regulation is part of an exam that must be passed by fishermen if they wish to obtain an authorisation or licence for commercial sea fishing.

To conserve biodiversity of marine fishery resources, the Marine Fisheries Management Plan for Waters under the Jurisdiction of the Republic of Slovenia, which was drafted in line with Council Regulation (EC) No 1967/2006, plays an important role. This plan defines proposals for management with trawl nets, boat seines, shore seines, surrounding nets and dredges as fishing gear.

The following policies and measures from numerous other fields also contribute to conservation of biodiversity of marine fisheries: data collection on fisheries (including biological data), record keeping on vessels authorised for commercial sea fishing in accordance with the gross tonnage and engine-power reference levels, equipping vessels exceeding 15 m in overall length with the Vessel Monitoring System (VMS), provision of

traceability (obligation to submit logbooks containing an entry for each catch regardless of the species and quantity of marine organisms caught), and measures governing leisure fishing at sea.

The Fisheries Research Institute of Slovenia is an institution providing an expert basis for decision-making on the management of marine fisheries, freshwater fisheries and aquaculture.

Expertise for planning the implementation of **freshwater fisheries** management in fisheries districts is provided by the Fisheries Research Institute of Slovenia on the basis of fish-population monitoring, annual reports on catches by concessionaires, as well as ichthyological and biological inventories of fisheries districts. A fisheries-management plan covering a period of six years is an obligatory expert basis for integrated fisheries management of an individual fisheries zone. Management in individual fisheries districts is based on six-year fish-breeding plans. These plans include fishing regimes (number of fishing days, fishing method, minimum sizes, closed seasons, maximum number of fish caught), sustainable breeding of indigenous fish species in fish-breeding parts, stocking and other activities associated with conservation of stocks of indigenous fish populations. Annual plans are prepared by concessionaires pursuant to fish-breeding plans. In cooperation with the Institute of the Republic of Slovenia for Nature Conservation, the Fisheries Research Institute of Slovenia drafts plans which are approved by the Minister of Agriculture, Forestry and Food in agreement with the minister responsible for nature and water protection. These plans enable sustainable use of fishery resources, compliance with all nature-protection guidelines, conservation of biodiversity and protection of protected fish species. Drafting of a long-term (12-year) management programme for fishery resources in inland waters is now envisaged.

Fisheries management in fisheries districts is performed by concessionaires. On the basis of a public call, concessions were granted in 2008 for the implementation of fisheries management in districts (inland waters in Slovenia are divided into 12 fisheries zones and 67 fisheries districts). Along with fishing, a concessionaire must also perform certain public tasks in his district (keeping, restocking with indigenous fish species, and other measures aimed at improving fish population and biodiversity).

Commercial fishing is prohibited in freshwater fisheries; leisure fishing with hooks is allowed but fishermen must report their daily catch. Concessionaires report on the annual catch in their districts to the fisheries cadastre kept by the Fisheries Research Institute of Slovenia.

With respect to measures for sustainable management of freshwater fish stocks, local genetic origin is taken into consideration in repopulation with indigenous fish species as part of fish-breeding plans (each plan must be approved by the Ministry of the Environment and Spatial Planning). Electro fishing is banned in general, but may be used for indigenous fish only for the purpose of sustainable breeding for restocking.

Sport fishing is also practiced in commercial ponds, which may be stagnant waters and for which a water right must be granted. With the exception of sustainable breeding in fish-breeding parts, fish breeding is performed solely on the basis of a granted water right for breeding of aquatic organisms.

## STRATEGIC DIRECTIONS

- To draw up fish-breeding plans on the basis of the abundance and species composition of fish populations within internationally recognised methodologies;

- To use in a sustainable manner species that are subject to marine fishing and harvesting of marine organisms while simultaneously reducing bycatch and negative impact of fishing on the benthic, pelagic and other communities of wild animals and plants;
- To gradually cease stocking all fish species into open waters in the ecologically important areas and to increasingly take into account local genetic origin in the stocking of indigenous fish species;
- To fish in such a way that the natural age structure of animal populations is not altered and to stop the fishing of indigenous species by electrifying devices;
- To physically enclose and separate commercial fish farms from natural watercourses to prevent escape of fish and organic pollution;
- To promote the breeding of indigenous fish species in commercial fish farms.

## Objectives for Sustainable Use of Biodiversity in Fisheries

Objectives (2001)	Measure	Indicator	Modification/Status 2009	Strategic Directions
To manage freshwater-fish populations on the basis of an expert and transparent definition of fish population sizes, while taking into account ecological processes in water ecosystems, the natural load-bearing capacity of the environment and nature-protection guidelines to conserve biodiversity.	Granting concessions for fisheries management in fisheries districts of inland waters.	Concessions granted.	Number of concessions granted in 2008; 67 (concessions were granted for a period of 30 years).	Management of fisheries districts in line with contracts between concessionaires and the grantor (Republic of Slovenia).
	Drafting of a 12-year management programme for fishery resources in inland waters.		- Programme is under preparation;	Management of fishery resources in inland waters in line with adopted management plans.
	Preparation of 6-year management plans for 12 fisheries zones and 6-year fish-breeding plans for 67 fisheries districts (the Fisheries Research Institute of Slovenia drafts management plans for fisheries zones and fish-breeding plans, which are approved by the minister of agriculture, forestry and food in agreement with the minister responsible for nature and water protection).	Management and fish-breeding plans define volume of catch for respective fishing districts, number of fishing days and maximum catch; fish-breeding plans enable sustainable use of fish while preserving the stock of indigenous fish species and protecting protected fish species.	Fisheries-management plans must be made by 2010 and the fish-breeding plan by 2011.	Fisheries management in line with fisheries management plans in fisheries zones and breeding plans.
	Fishing is allowed solely on the basis of a valid fishing licence in which the fisherman must record his catch; only fishing with pole, lines and hooks is permitted; minimum	Catch of individual fishing species.	Changes to fishing regimes.	Use of fishery resources in a scope enabling conservation of indigenous fish species and protection of protected species.
				Potential upgrading of the fisheries cadastre.



### Objectives for Sustainable Use of Biodiversity in Fisheries

Objectives (2001)	Measure	Indicator	Modification/Status 2009	Strategic Directions
	<p>sizes of fish caught and closed seasons are prescribed to guarantee sustainable use of fishing species.</p> <p>Setting up a fisheries cadastre composed of databases that are important for fisheries planning, preparation of expert basis and opinions, measures and regulations concerning freshwater fishing.</p> <p>Monitoring on the basis of biological and ichthyological inventories in line with the work programme of the Fisheries Research Institute of Slovenia.</p> <p>To supervise implementation of legislation on freshwater fisheries.</p>	<p>Fisheries cadastre.</p> <p>- Changes to monitoring results;</p>	<p>Modernisation and upgrading of the fisheries cadastre in a computer application in 2009.</p>	<p>taking into account new requirements (primarily geographic layers).</p>
<p>To ensure sustainable use of biotic resources, subject to marine fishing and harvesting of marine organisms,</p>	<p>Fisheries management in line with the EU Common Fisheries Policy.</p>			<p>Fisheries management in line with the EU Common Fisheries Policy.</p>

## Objectives for Sustainable Use of Biodiversity in Fisheries

Objectives (2001)	Measure	Indicator	Modification/Status 2009	Strategic Directions
and to conserve biodiversity in marine and coastal habitat types.	<p>Collection of fisheries data (biological, technical, environmental and socioeconomic data) in line with EU regulations and introduction of cross-checking of data in the InfoRib system.</p> <p>To set up records of vessels authorised for commercial sea fishing in line with EU regulations (InfoRib information system).</p> <p>Coordination of fishing effort with active fishing gear in line with the Marine Fisheries Management Plan in the waters under the jurisdiction of the Republic of Slovenia.</p> <p>All vessels exceeding 15 m in overall length were equipped</p>	<p>Current national programme for fisheries data collection.</p> <p>Reference levels for gross tonnage (GT) and engine power (kW) for Slovenia in line with EU regulations: 1,057 GT and 10,974 kW.</p> <p>Coordination of fishing effort with surrounding nets, shore seines, boat seines, trawl nets, pelagic trawl nets and dredges.</p> <p>Number of vessels equipped with VMS.</p> <p>Each catch must be recorded in logbooks according to species and quantity, logbooks are entered into the InfoRib</p>	<p>Current national programme for fisheries data collection 2009/2010.</p> <p>Slovenian fleet for commercial sea fishing in terms of GT and kW as of 31 December 2008: 983 GT and 10,653 kW.</p> <p>- Registered as authorised for commercial sea fishing: 5 vessels with surrounding nets, 0 vessels with shore seine, 0 vessels with boat seine, 27 vessels with trawl nets, 13 vessels with pelagic trawl nets, 9 vessels with dredges (Note: A vessel can have several fishing gears registered in its authorisation for commercial sea fishing).</p>	<p>Further collection of fisheries data in line with EU regulations.</p> <p>Fleet management with respect to the reference level.</p> <p>Equipping fishing vessels with VMS in line with EU Common Fisheries Policy.</p> <p>Upgrading of traceability system for fisheries products in line with EU regulations.</p>

### Objectives for Sustainable Use of Biodiversity in Fisheries

Objectives (2001)	Measure	Indicator	Modification/Status 2009	Strategic Directions
	<p>with the Vessel Monitoring System (VMS) in line with EU regulations.</p> <p>Setting up a system for traceability of fisheries products in line with EU regulations.</p> <p>No authorisations are required for leisure fishing from the coast, but a fishing licence is required for leisure fishing from a boat.</p> <p>Biological sampling of the catch in marine fisheries.</p>	<p>information system.</p> <p>Records of annual licences for sport fishing, annual licences for sport fishing with a spear gun and fishing licences.</p> <p>Sampling is annually performed by the Fisheries Research Institute of Slovenia.</p>	<p>8 vessels with overall length exceeding 15 m are equipped with VMS.</p> <p>Allowable daily catch in leisure fishing at sea is maximum 5 kg of fish.</p> <p>Pilchards and anchovies, bycatch and discards are sampled.</p>	<p>Management of leisure fishing at sea in line with existing system and EU regulations.</p> <p>Continuation and potential expansion of biological sampling.</p>

### 8.7.5. Water management

The amended Waters Act, the Resolution on the National Environmental Action Programme 2005–2012 (ReNPVO), (Ur. l. RS, no. 2/06), regulations, reports on implementation and the Water Management Plan (WMP) constitute the regulatory basis for water management.

The main environmental objectives covering surface water bodies (SWB) are to achieve favourable ecological and chemical status by 2015. Achievement of these objectives is also closely linked with objectives to reduce pollution from priority substances and elimination of emissions of priority substances to attain concentrations that are close to the values of the natural background.

Detailed environmental objectives for water bodies have been defined as follows:

- The objective for SWB for which favourable chemical status is expected to be achieved by 2015 (probability assessment 2015=1, 2 and 3), is covered by "Preventing status deterioration", with the protection and conservation of favourable status of these water bodies to be ensured in the future;
- The objective "Achievement of favourable status", i.e. favourable chemical and ecological status of surface waters, concerns SWB for which the 2015 probability assessment shows that without appropriate supplementary measures, environmental objectives will not be attained by 2015;
- The objectives "Progressive reduction of pollution from priority substances" and "Ceasing or phasing out emissions, discharges and losses of priority hazardous substances" concern SWB where, according to data collected by the Environmental Agency of the Republic of Slovenia, emissions of priority and/or priority hazardous substances from point sources of pollution took place in 2007.

Heavily modified and artificial water bodies are subject to somewhat different criteria. By 2015, favourable chemical status and ecological potential are required to be achieved in these water bodies. Since the ecological potential has so far not yet been defined, these water bodies (WB) fall under "Preventing status deterioration". The aim of this objective is to keep the load status at the current level, until the ecological potential has been defined.

#### STRATEGIC DIRECTIONS

- To integrate biodiversity conservation objectives into all aspects of water management and to take into account nature-protection guidelines for the Water Management Plan covering the Danube and the Adriatic Sea aquatic area;
- To ensure nature-friendly management of watercourses as integral systems and to manage them in a way that guarantees conservation or restoration of the natural dynamics of waters; to this end, the main tasks are the conservation and restoration of the embankment area and the flood zone, which functions as the habitat, or part of it, of many plant and animal species, in particular endangered species;
- To conserve and, where possible, restore the passages between particular water bodies to ensure migration routes for animals;
- To carry out activities at a time of year that does not coincide with the breeding season of animals and plants;
- To manage waters and the water infrastructure network, including the removal of deposits and vegetation, in a manner that does not reduce biodiversity;
- To remove gravel in an amount and manner that does not reduce biodiversity;
- To guarantee the fulfilment of water-management objectives through reactivation of potential retention zones and creation of new ones;
- To ensure ecologically acceptable water flow rates in all seasons, in particular during the period of natural low flow rates.

<i>Objectives for Conservation of Inland Water Biodiversity and Water-management Objectives</i>			
Objective (2001)	Implementation	Modification/Status 2009	Strategic Directions
To conserve existing ecologically important wetlands and their habitat types at a favourable status and to restore the ecological characteristics of degraded inland waters, bogs and marshes, where feasible.	Determination of biotically highly diverse or well-preserved habitat types and habitats of endangered plant or animal species through Decree on Special Protection Areas (Natura 2000 Sites), Waters Act (Ur. I. RS, no. 67/02, 110/02) and Act Amending the Waters Act (ZV-1A) (Ur. I. RS no. 57/08).  Establishment of Ljubljansko Barje Landscape Park.		Establishment of Radensko Polje Landscape Park is under way.
To consider waters as a system in which groundwater and surface waters and their habitat types form an integral whole.	Decree on Provisional Water Management Plan (Ur. I. RS, no. 4/09);  Groundwater Directive (2006/118/EC)*;  Rules on Determination of Groundwater Bodies (Ur. I. RS, no. 63/05);  Rules on Determination of Surface Water Bodies (Ur. I. RS, no. 63/05).		WMP (2009).
To attain such water quality standards that exceptionally diverse, with regard to biotic characteristics, and well-	Directive on Environmental Quality Standards in the Field of Water Policy (2008/105/EC), Bathing Water		

<i>Objectives for Conservation of Inland Water Biodiversity and Water-management Objectives</i>			
Objective (2001)	Implementation	Modification/Status 2009	Strategic Directions
preserved habitat types and habitats of endangered and endemic plant and animal species are not threatened, in particular by reducing industrial, agricultural and urban pollution of water.	<p>Directive (2006/7/EC), 76/160/EEC), Nitrates Directive (91/676/EEC) and Operational Programme;</p> <p>Water scarcity and droughts (EC Communication),</p> <p>Adaptation to climate change (EC Communication),</p> <p>White Paper on Adapting to Climate Change.</p>	<p>Ordinance on Establishment of Government Office for Climate Change (Ur. I. RS, no. 49/09).</p>	
To prevent introduction of alien species into inland waters and the spread of already introduced alien species to ecologically important areas.	The Freshwater Fishery Act (2006) provides that re-stocking may only take place with fish from the same water basin and originating from sustainable breeding, while prohibiting transfer of live fish into other waters.	In WMP, alien, invasive species are treated as load.	
To encourage land use on river banks and in alluvial river areas to conserve habitat types that maintain the water cycle, and are important for conservation of biodiversity and reduction and prevention of damage caused by waters.	<p>Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on assessment and management of flood risks (Floods Directive) – transposition at the national level:</p> <p>Waters Act Ur. I. RS, nos. 67/02, 110/02) and Act Amending the Waters Act (ZV-1A) (Ur. I. RS no. 57/08);</p> <p>Decrees on conditions and restrictions regarding the performance of</p>		

<i>Objectives for Conservation of Inland Water Biodiversity and Water-management Objectives</i>			
Objective (2001)	Implementation	Modification/Status 2009	Strategic Directions
	activities, including spatial planning activities, in areas endangered by floods and the associated erosion of inland waters and sea (Ur. I. RS, no. 89/08).		
To adjust land use to natural water regimes and to concentrate related activities outside of areas of intensive hydrodynamic processes and areas of strategically important water resources.	Decree on Provisional Water Management Plan (Ur. I. RS, no. 4/09),		WMP.
To manage and protect waters in a manner that conserves biodiversity and ensures sustainable use of waters.	Decree on Provisional Water Management Plan (Ur. I. RS, no. 4/09).		WMP.
To manage waters in a comprehensive manner by taking into account their dynamics and natural processes, as well as interconnection and interdependence of the relevant habitat types.	Decree on Provisional Water Management Plan (Ur. I. RS, no. 4/09); Decree on Surface Water Status (Ur. I. RS, no. 14/09).	Decree amending the Decree on detailed content and the manner of drafting water management plans (Ur. I. RS, no. 5/09).	WMP.

#### 8.7.6. Industry and energy sector

Within the industry and energy sector there is too little cooperation with the field of biodiversity conservation, which is particularly due to planning policies and programmes of further development that do not consider biodiversity-conservation objectives. Further development of energy sources also does not sufficiently consider the principle of reducing their use and improving the situation. Moreover, planning and use of renewable energy sources are quite often in conflict with nature conservation. Consideration of new principles of the valuation of nature and ecosystem services demonstrates the urgent nature of nature conservation and the incorporation of the value of ecosystem services and biodiversity into sustainable development planning.

Both objectives from the 2001 Strategy (to ensure the competitive position of industry through sustainable development that conserves biodiversity, and to guarantee a reliable and sufficient long-term energy supply that is environmentally friendly and conserves biodiversity, while encouraging efficient energy use) require specific measures and consideration of strategic directions for their realisation.

#### STRATEGIC DIRECTIONS

- To use energy and natural resources more efficiently and to take into account energy-intensity trends in energy supply;
- To reduce greenhouse-gas emissions;
- To promote investments in clean industrial technologies and reduce emissions of harmful substances;
- To promote industrial activities in areas where suitable infrastructure is in place, where it is possible to prevent environmental disasters, and where biodiversity is not threatened;
- To avoid construction of new energy-supply facilities in ecologically important areas or areas which are part of the ecological network.

#### 8.7.7. Transport

##### OBJECTIVE:

- To guarantee mobility of people and cargo that conserves biodiversity.

Slovenia, like the majority of developed countries, is facing an important development dilemma. There is a strong ambition to ensure a high level of accessibility and mobility, while at the same time to avoid any negative impacts. Given the current lifestyle of the population, access to a reliable transport system is fundamental, since for the majority of people, mobility constitutes a precondition for their quality of life. People are nevertheless aware of the negative impact of the transport system on quality of life and show considerable concern. Transport can thus be considered both helpful and harmful. Resolving this conflict between the positive and negative effects of transport requires much more than just the recognition of its existence. The growth rate and the structure of transport suggest the same (and in certain aspects even more serious) environmental problems. Slovenia is characterised by an above-average increase in road transport and a reduction in railway and public passenger transport, which are becoming increasingly uncompetitive. In Slovenia, comprehensive consideration of the transport system is only in the preparatory phase, while the national transport policy does not essentially influence developments in individual transport sub-systems. This leads to enhanced environmental problems caused by transport. Climate change is the most relevant environmental consequence ascribed to transport. Slovenia, like other EU Member States, has, in accordance with the Kyoto Protocol, committed itself to reducing greenhouse-gas



emissions. In spite of this commitment, emissions have doubled over the last 20 years in Slovenia.

Although emissions from transport have in recent years been reduced to a certain degree, the focus of transport-related environmental problems remains air pollution. Technological improvements, as a response to EU emission legislation, have contributed to a noticeable reduction of the discharge of pollutants into the air. Standards are being tightened and old vehicles replaced with new, cleaner ones. Transport is also characterised by other negative impacts, such as use of non-renewable energy sources, irreversible land use, noise, accidents, vehicle waste, inland water and sea pollution, fragmentation of land and natural habitats, and loss of biodiversity. These environmental problems frustrate the objective of sustainable development that we are striving for. Their resolution will require lengthy and coordinated efforts in several areas. Demand management and introduction of new technologies must become central areas of the implementation of transport and spatial policies.

#### *8.7.7.1. Road transport*

Growing traffic congestion is a result of the increase in car and freight transport, which cause the majority of environmental problems in this area. Due to a lack of competitiveness, the share of railway and public passenger transport is decreasing, while non-motorised forms of transport are also being neglected. Slovenia and the majority of its towns have to date favoured the development of road transport in spite of its numerous negative environmental, economic and social impacts. This attitude is demonstrated by accelerated investments in road infrastructure, and simultaneous neglect of public passenger transport (PPT) and the development of other sustainable modes of transport, including non-motorised forms. This unbalanced development of the transport system is further emphasised by the change in Slovenia's spatial structure, which is increasingly based on accessibility by cars and lorries. The majority of the population therefore satisfies their needs for mobility by using cars, while the majority of freight is also transported by road. An increase in the share of more sustainable transport modes (railway, PPT and vessels) at the expense of road transport is a basic objective of EU transport policy, which envisages the introduction of a more sustainable transport system by 2010.

#### *8.7.7.2. Greenhouse-gas emissions*

Greenhouse-gas emissions from transport, which are the result of fossil-fuel combustion, have more than doubled in Slovenia over the last 20 years. During the last decade, transport has been ranked second among sectors by energy consumption, behind energy. This consumption is almost exclusively based on fossil fuels and greenhouse-gas emissions have thus increased in proportion to their growing use. The vast majority of emissions are the result of road transport. The restriction of emissions that contribute to the global temperature and sea-level rise was given a legal basis through adoption of the Kyoto Protocol. Through the obligations imposed by the Protocol, the control of the growth in fossil-fuel use in transport became a major political and environmental issue. However, in spite of this, EU and Slovenian transport policies do not include specific objectives to reduce the use of energy in transport.

Air pollution and its impact on biodiversity can be effectively reduced through introduction of environmental zones, where driving environmentally burdening vehicles, e.g. cargo vehicles, is restricted. Since older lorries and passenger cars contribute a great deal of this type of emissions, restricting their use can be very effective.

### STRATEGIC DIRECTIONS

- To transfer transport to the more environmentally acceptable modes that have not yet been sufficiently exploited (e.g. railway transport);
- To control pollution caused by transport by avoiding unnecessary or redundant transport and by less transport-intensive development in the industrial and urban sectors;

- To technically improve vehicles and fuels to reduce emissions and energy consumption; to develop new drive modes and promote the collection and recycling of used vehicles;
- To incorporate biodiversity-conservation principles into transport policy and the development of infrastructure, i.e. to avoid as much as possible areas of high nature value.
- To prevent or limit negative impacts on landscape and ecosystems of construction of infrastructure and relevant activities and to optimally use the existing infrastructure;
- To stop fragmentation of ecosystems caused by the construction of new infrastructure facilities and to guarantee suitable passages for animals.

#### 8.7.8. Tourism

##### OBJECTIVE:

- To formulate balanced and sustainable tourist products and services by incorporating outstanding natural features and by taking into account the potential of the entire state and the risk to particular outstanding features.

In Slovenia's Development Strategy to 2013, the Slovenian Government identified sustainable development as one of fundamental principles of the country's development. Sustainable development of tourism is also defined as a fundamental principle in the Promotion of Tourism Development Act (Ur. l., no. 2/04). This principle is accordingly considered a key paradigm of Slovene tourism development in the Development Plan and Policies of Slovene Tourism (DPPST) 2007–2011, which also implements it directly by promoting sustainable development at tourist destinations and, indirectly, by integrated elements of encouraging sustainable development within the envisaged activities and orientations of other basic policies, notably spatial and investment policy.

Tourism is an important user of space and, by influencing local communities and the quality of life, and as a user of cultural and natural resources, plays an important environmental role in a broader sense. Since tourism also markets space, DPPST pays particular attention to sustainable development.

Through balanced economic, social and environmental development, Slovenia wishes to achieve a significant contribution by the tourist sector to the economic and social welfare of citizens and to the satisfaction (and well-being) of tourists. In this context, tourism policy must assure that three key conditions for sustainable development in the tourism sector are met:

- Protection of the natural environment and sustainable use of available resources (in particular, resources of vital importance or non-renewable resources);
- Overall conservation and sustainable use of cultural heritage;
- Consideration of society, respect for its cultural values (identity) and prevention of any negative impacts of mass tourism.

The policy of spatial development of tourism pays special attention to rational siting and building of tourist facilities and, indirectly, to care for the preservation of natural assets and cultural heritage as the main resources of tourism. For the development of tourism, it is of utmost importance that the systemic, institutional and instrumental bases of spatial development and environmental-protection policy become friendly towards tourism investments and activities, and towards tourists themselves as the source of tourism consumption. This applies particularly to protected areas, in which it is necessary to assure a balance between environmental protection and development.

**DPPST measures** specifically intended to promote sustainable development of tourism include:

- Development of indicators for sustainable tourism:  
OBJECTIVE – Encouraging the development and monitoring of the implementation of sustainable development,  
Defining key indicators for sustainable development of tourism at tourist destination;
- Spatial planning for development of tourism:  
OBJECTIVE – Assuring favourable spatial conditions for the development of tourism, in accordance with the principles of sustainable development;
- Creating conditions for the development of tourism in protected areas:  
OBJECTIVE – Assuring favourable spatial conditions for the development of tourism in protected areas (emphasis on Natura 2000 areas).

Within annual tourism policy, sustainable and regional development of tourism is covered by specific measures.

The Ministry of the Economy has carried out several activities related to implementation of measures under Agenda 21 and supported these measures during Slovenia's Presidency of the EU Council.

During its EU Presidency in 2008, Slovenia organised the first seminar in a series of EU public-awareness campaigns supported by the European Commission and related to the possibilities offered by various EU funds for the implementation of the objectives of the Agenda for Tourism. For national stakeholders in the area of tourism, the Ministry of the Economy organised a conference entitled "Presentation of activities for sustainable European tourism".

Among the key national measures in implementing EU policies of the Agenda for sustainable and competitive European Tourism is Slovenia's integration into priority European Commission measures on realising the sustainable concept of European tourism, i.e. Slovenia's participation in the EC's EDEN ecotourism project. The project is based on annual national competitions and selection of a European destination of excellence.

The Ministry of the Economy co-finances implementation of the following programme: Development of existing programmes of ecological management of beaches and marinas (**Blue Flag**) and upgrading the development of other programmes to promote the quality of the environment in tourism and provision of environmental information.

The ministry is co-financing the costs of the introduction of the EU ecolabel (EU flower) for tourist accommodation by way of a public tender.

Special attention is being paid to the promotion of quality tourism, based on sustainable-development principles to encourage **the introduction of ecological management in Slovene tourist companies** and **the introduction of the hotel service quality system** (both programmes or manuals are available on Ministry of the Economy websites).

On the basis of these manuals, in 2007 and 2008 the ministry organised free workshops for representatives of the Slovenian tourism economy that were exceptionally well attended.

An interesting example of the interconnection between tourism and biodiversity conservation is the traditional Bohinj Flower Festival organised by the local tourist organisation with the assistance of several partners. The purpose of the event is to demonstrate the importance and usefulness of plants in all fields, from nutrition to culture.

## STRATEGIC DIRECTIONS

- To include biodiversity components in tourist products and services and thus develop new tourist products and services that increase profit and create new jobs;
- To reduce burdening of the environment by tourism through promotion of environmentally acceptable activities suitable for the local tourist economy;
- To develop and construct tourist and recreational infrastructure suitable for specific protected areas, in particular in and near national, regional and landscape parks, to direct public access to areas, including recreational zones, within the protected area;
- To introduce zoning in protected areas to direct public access by classifying areas into several categories, from areas where access is prohibited to areas where construction of tourist infrastructure is welcome;
- To promote environmentally friendly and balanced growth of tourism and other activities, while simultaneously reducing pressure on biodiversity;
- To coordinate spatial distribution and timing of activities to avoid disturbing animals and plants, and prevent their destruction;
- To raise awareness of employees of tourist facilities and tourists about the importance of biodiversity for high-quality tourist products and services (e.g. competitions for nature protection or environmental-protection awards).

### *8.7.9. Measures to mitigate climate change*

The Convention on Biological Diversity (CBD) is one of the three conventions deriving directly from the Earth Summit held in 1992 in Rio de Janeiro, along with the UN Framework Convention on Climate Change (UNFCCC) and the UN Convention to Combat Desertification (UNCCD). While climate change has become one of the hottest topics and has had a significant impact on political decision-makers and the general public, the other two agreements have remained in the shadows in relevant discussions. They are, nevertheless, equally important in the current rapidly changing global environment.

Slovenia emphasises the urgency of the synergy of the Rio conventions to achieve sustainable development. Within measures to achieve the 2010 EU objective, Slovenia aims at demonstrating concrete results through:

- Establishment of enhanced collaborative work on the UNFCCC and the CBD at the national level, emphasised by the EU to achieve synergy between Rio conventions;
- Intersectoral cooperation in achieving the 2010 biodiversity objective by considering forest biodiversity;
- Conclusion of the preparation of the action plan for biodiversity conservation and its implementation, and the **Natura 2000 Site Management Programme (Operational Programme 2007–2013)**.

In this context, it should be highlighted that Slovenia will particularly call for early introduction of second-generation biofuels within the EU, with wood biomass as the basic source of production. Thus, the issue of biofuels is directly related to forest biodiversity. Due to the relevance of this topic, an informal meeting on second-generation biofuels and the impact of their production on forest biodiversity in Slovenia was held between EU ministers of the environment during Slovenia's Presidency of the EU Council.

The Government Office for Climate Change was established in 2009, while the Climate Change Act, which also covers biodiversity, is currently being drafted.

## **8.8. Support activities**

### *8.8.1. Legislative and economic mechanisms*

#### **OBJECTIVES:**

- To enforce biodiversity conservation measures provided for in the Nature Conservation Act;
- To enforce measures for conservation of biodiversity and sustainable use of its components provided for in the National Environmental Action Plan.

#### *8.8.1.1. Legislation governing conservation of biodiversity and protection of valuable natural features*

*(See Chapter II)*

#### *8.8.1.2. Financial resources for conservation of biodiversity and protection of valuable natural features*

The programme policy of nature conservation is a priority in the National Environmental Action Plan (NEAP), while its implementation is fully within the domain of the Republic of Slovenia. In the period 2006–2010, relevant funds from the national budget were earmarked for the conservation of biodiversity and natural assets. Preservation of a high level of biodiversity was also fully financed from budgetary funds. Given the objectives of the EU Birds Directive (79/409/EEC) and the Habitats Directive (92/43/EEC), measures on the preparation and implementation of programmes related to management of special protected areas and integration of Natura 2000 objectives into other plans, such as forest-management, game-breeding and hunting and fishery plans, have been financed as a matter of priority. Appropriate attention should also be paid to training teams for communication and awareness-raising, as well as to promotion intended for the visitors of Natura 2000 areas. To improve the effectiveness of protection measures and prompt assessment of conservation status, monitoring of biodiversity and natural value is required, along with monitoring of implementation of priority nature-conservation policies within Natura 2000 sites and within plant and animal habitats the conservation of which is in the interest of the European Union. In this context, it is essential to establish or upgrade the information system in the field of nature conservation. National budgetary funds are also earmarked for the implementation of "renaturation" projects in terms of habitat rehabilitation and improvement, purchase of as much land as possible that is relevant to biodiversity conservation, as well as for compensation due to loss of development rights and reimbursement for damage caused by protected animal species. Current management measures related to Natura 2000 agricultural and forest areas financed by the Ministry of Agriculture, Forestry and Food as a matter of priority by means of EU funds (the Rural Development Programme and European Agricultural Guidance and Guarantee Fund). Investment and "renaturation" measures are additionally funded through structural funds, while programmes for the promotion of sustainable development are financially supported by the Cohesion Fund (including Leader and Interreg).

To implement management programmes for Natura 2000 areas, it has been necessary to upgrade the existing structure of management in charge of areas under protection (public institutions and concessionaires). Along with the completion of the entire personnel and organisational structure in the area of nature conservation, the integration of NGOs in conservation efforts and the improvement of harmonisation of scientific and research programmes with nature-conservation requirements, it was also necessary to ensure implementation of other tasks in the area of biodiversity conservation and protection of natural assets. Data on national budgetary funds for 2006–2010 are indicated in the table below.

Table: Budgetary resources earmarked for the conservation of nature in the 2006–2010 period (in EUR):

ACTIVITIES	YEAR				
	2006	2007	2008	2009	2010
<i>Protected areas</i>	3,175,494	3,374,000	4,223,003	4,212,706	4,640,380
<i>Natura 2000</i>	303,600	2,888,000	530,000	691,989	656,411
ZRSVN	2,007,757	2,036,000	2,036,491	2,784,161	2,710,290
ARSO (nature)	503,343	650,977	595,563	955,704	953,916
Implementation of measures of ZoN (Nature Conservation Act)	775,486	800,977	732,622	1,091,492	115,779*
<i>Public Sector Salary System Act – Public Institutions Fund</i>	14,227	15,000	-	-	-
<i>LIFE international projects</i>	415,180	416,000	550,000	316,850	310,929
<i>International/EU activities</i>	21,602	22,000	21,670	21,670	21,168
<i>Biotechnology</i>	169,245	170,000	159,771	177,476	146,523
Donations (Dinaric Arc)	-	-	-	18,103	22,081
TF-EU-communication in the Natura 2000 areas – donation	449,280	225,000	-	-	-
<i>Own funding</i>	149,760	150,000	-	-	-
PHARE CFCU-Programme of cross-border cooperation with Austria	995,941	-	-	-	-
<i>Own funding</i>	336,140	-	-	-	-
<b>TOTAL</b>	<b>8,977,209</b>	<b>7,498,977</b>	<b>8,253,557</b>	<b>9,314,447</b>	<b>9,577,477</b>
Ministry of the Environment and Spatial Planning – funds for nature protection	0.12%	0.09%	0.09%	0.10%	0.09%
Share of national budget allocated to the Ministry of the Environment and Spatial Planning	2.14%	3.24%	2.53%	2.86%	2.82%

Nature conservation is, as a rule, mainly a **non-profit** activity by its nature, which must be provided by **the state and local communities** in line with their responsibilities. This definition places nature conservation activities **within the public financing system** that is generally implemented through the national budget. Thus it is determined by law that the state and local communities bear the public costs of nature conservation. The state guarantees funds for measures aimed at biodiversity conservation and at the protection of valuable natural features, for the implementation of the public service of nature conservation and for compensations under the provisions of the Nature Conservation Act. Local communities guarantee funds for measures aimed at protection of valuable natural features, for the implementation of the public service of nature conservation and for compensation when it is related to protection of valuable natural features of local relevance.

The law also foresees other sources of financing for the public service of nature conservation, which are regulated through the financing of institutions as entities that perform a public-service activity. This includes **payments for performed services, grants, donations and other sources allowed by the statute.**

The Farmland and Forest Fund, which, on behalf of the state, manages farm land and forests that are property of the state and located in protected areas established by the state, remits managers of these areas **a part of the excess of revenue over expenditure of the fund** defined annually by the Government. These funds must be used for the intended purpose: execution of measures for conservation of biological diversity of farmland and forests in compliance with the annual programme prepared by the manager.

Along with the system of public, direct and purpose-based financing of nature conservation determined by the Nature Conservation Act, the financing of nature conservation by funds provided through other sources, in particular international financial sources, foreign or domestic donations and sponsorships, is of equal importance. These funds can be used by public institutions, local communities, non-governmental organisations, companies or individuals.

INTERNATIONAL FINANCIAL SOURCES are sources available to international governmental and non-governmental organisation, convention secretariats and the European Union. These funds are earmarked for support of different nature-conservation measures and activities working with individual states through public tenders or implementation of programmes.

The EU has several financing instruments at its disposal, such as structural and cohesion funds, pre-accession programmes, thematic programmes, etc. **LIFE III – Nature** is the EU's financial instrument designed for the nature conservation and providing financing of nature-conservation projects related to conservation of Natura 2000 areas and habitats of protected plant and animal species. Public tenders within this programme were concluded in 2005. **LIFE +** is a new method of financing environmental programmes, including the nature conservation and biodiversity programme.

The European Union also co-finances **agri-environmental measures (AEM)**, whose purpose is, in addition to popularisation of agricultural production that meets the needs of customers and protects their health, to provide sustainable use of natural resources, to reduce negative impacts of agriculture on the environment and to conserve biological diversity and protected areas. Agri-environmental programmes, aimed at enhancing the conservation of endangered plant and animal species and at increasing concern for the landscape, began to be implemented in 2003 within the work of the Ministry of Agriculture, Forestry and Food. The most important measures are: mountain pasture, mowing steep meadows and bumpy meadows, preserving meadow orchards, preserving extensive grassland, preserving cultivated and inhabited landscape in protected areas, breeding domestic animals in the central area of large carnivores, preserving specific grassland habitats. Measures for conservation of biodiversity are implemented in ecologically important areas that also include Natura 2000 areas.

#### *8.8.2. Spatial Management*

##### OBJECTIVES:

- Proper integration of concern for conservation of biodiversity in spatial-planning documents and into procedures of preparing spatial-planning and implementing acts (e.g. vulnerability studies, comprehensive environmental-impact assessment and environmental impact assessment), in particular in protected and internationally important areas;
- Supporting inclusion of the public in procedures to prepare and adopt spatial-planning documents.

## GUIDELINES

- Upgrading the legislative basis for ensuring high-quality impact assessment that will include assessment of biodiversity loss and loss of landscape diversity;
- Improving the revision of content of spatial-planning documents.

Spatial development is planned at the national and local levels. At the state level, the ministry responsible for spatial development is responsible for preparation of strategic spatial-planning documents (the Spatial Development Strategy of Slovenia, 2004) and for leading the preparation of state spatial plans for spatial arrangements of national importance that include state traffic, energy, environmental and other infrastructure. At the local level, municipalities that prepare municipal spatial-planning documents and municipal detailed planning documents are responsible for spatial planning. If they agree so with other municipalities, they may also prepare inter-municipal planning documents for implementing projects from the relevant regional programme. The spatial-planning documents listed are in a hierarchical relationship, which means that a document from an inferior level must comply with a higher-ranking spatial planning document (i.e. it must not be in conflict with it). Compliance is checked during the preparation procedure of a spatial-planning act. The preparation process is prescribed by the relevant statute (the Spatial Planning Act, 2007). Under this act, the following entities are involved in the preparation process: the responsible body (the ministry or the municipality, depending on the type of spatial-planning document), the developer (outside institution), the responsible bodies regulating spatial development (ministries vested with public authority) and the public. The initial stage of every spatial-planning document involves decision-making in compliance with the Environmental Protection Act, to determine whether a comprehensive environmental-impact assessment and assessment of the acceptability of impacts on the natural environment needs to be implemented or not within the procedure of preparing the spatial-planning act, which is headed by the ministry responsible for the environment. When national spatial-planning documents are being prepared, a comprehensive environmental-impact assessment is carried out in the stage of elaboration of a study of alternatives, which in addition to the environmental part (comprehensive environmental-impact assessment of a particular alternative) also encompasses impact assessment from technical and economic aspects.

Biodiversity assessment is part of the acceptability assessment of the spatial-planning document for the natural environment, if the latter is required, which is decided by the responsible body on the basis of an opinion submitted by the public service responsible for nature conservation. The decision is adopted on the basis of spatial arrangements regulated by a specific spatial-planning document, and the characteristic features of the area to which it refers. In general, an assessment is undertaken if the spatial-planning document in question contains Natura 2000 areas; however, it may also be undertaken if the foreseen spatial arrangements in the Natura 2000 impact area may influence Natura 2000 areas. If the decision is affirmative, an environmental report on the impact of the planned spatial arrangements is required. The environmental report is also tabled, normally together with the spatial-planning document, after the developer has obtained an affirmative opinion from the service responsible for comprehensive assessment.

The public is also included in preparation procedures for a spatial-planning document during the stage of its preparation (supplemented draft). The developer is obliged to organise the tabling of the spatial-planning document, which must be for a period of at least 30 days, and its reading in a local community. During this time, the public can submit written or oral comments. The developer takes a position on particular comments and proposals, which is approved by an appropriate body (the Government or municipal council). These approved proposals are duly taken into account when preparing a draft spatial-planning document.

The Spatial Planning Act determines that bodies responsible for spatial planning must submit their opinion in the final stage of preparation of a spatial-planning document, wherein they



check adherence to preliminary guidelines on preparing a spatial-planning document. Preparation of spatial-planning act is completed by approval of compliance on the part of the minister of the environment and spatial planning, and by its adoption on the part of the relevant administrative-level authority heading the preparation process (national spatial-planning documents are adopted by the national parliament and municipal spatial-planning documents are adopted by the municipal council), and by publication in the official gazette. In the process of monitoring preparation of municipal spatial-planning documents, the ministry responsible for the area of the development (the local community) draws attention to any potential non-compliance in terms of substance or conflicts with the adopted spatial-planning strategy. Local communities or spatial planners who prepare the spatial-development plan are obliged to observe the provisions of implementing regulations that determine the contents of a particular spatial-development plan and also the Spatial Order of Slovenia (2004), which determines general and special rules for development planning.

Comprehensive assessment and acceptability assessment are implemented on the basis of implementing regulations in partnership with the Comprehensive Assessment section and the Nature section of the Ministry of the Environment and Spatial Planning.

### *8.8.3. Monitoring*

#### OBJECTIVES:

- Upgrading the list of species and populations for Slovenia
- Monitoring the impacts of the most important pressures on biodiversity on the basis of a set of indicators;
- Monitoring reactions to reduction of pressures and also society's willingness to change established behavioural patterns;
- Providing access to interpretations of collected data and data themselves, if appropriate.

Article 11 of the Habitats Directive and Articles 4 and 12 of the Birds Directive impose on EU Member States a duty to implement the monitoring of the status of species conservation and to report on the results at regular intervals. Article 108 of the Nature Conservation Act also regulates this monitoring. Monitoring implementation further increases the volume of data serving as the basis for impact assessment on the natural environment as part of acceptability assessment of plans, and in certain cases, the data collected already permit the selection of alternatives.

Under Article 17 of the Habitats Directive, EU Member States must make a report on implementation of measures laid down by this Directive every six years. In particular, this report includes information on preservation measures from Article 6 (1), evaluation of the impacts of these measures on the state of preservation of natural habitat types from Annex I and species from Annex II and the main results of monitoring this state from Article 11. The major part of the report consists of evaluation of conservation-status indicators for species and habitat types from all Annexes across the whole national territory.

In Slovenia, the Ministry of the Environment and Spatial Planning is responsible for reporting, and the Institute of the Republic of Slovenia for Nature Conservation, in partnership with the Slovenia Forestry Service and the Fisheries Research Institute of Slovenia, is the coordinating body for reporting for species and habitat types. Slovenia reported on 203 species and 60 habitat types in two bio-geographical regions for the period 2004–2006.

The final summary table with the contents of the report for species and habitat types is published on

[http://www.zrsvn.si/dokumenti/65/2/2008/hd\\_porocanje\\_1216.xls](http://www.zrsvn.si/dokumenti/65/2/2008/hd_porocanje_1216.xls)

The collected data are not complete because they are not a result of a systematic approach; however, they are the best assessment of the original status so far.

Following a request placed by the Ministry of the Environment and Spatial Planning and the Environmental Agency of the Republic of Slovenia, a number of studies have been prepared and published on the website:

<http://www.natura2000.gov.si/index.php?id=211>

Moreover, monitoring is also part of the sectoral programmes and is included in the preceding chapters.

#### STRATEGIC DIRECTIONS

- Adoption of legal provisions on the internationally comparable monitoring of biodiversity indicators at the ecosystem, species and genetic levels;
- Further implementation of the national biodiversity monitoring programme;
- Central coordination and record keeping on listing (inventory-making) and monitoring of biodiversity;
- Transparent presentation of methods for establishing the status of biodiversity and encouraging responses to negative trends;
- Defining indicators for impact assessment of interventions and activities on the components of biodiversity and for progress assessment in strategy implementation;
- Monitoring indicators of interventions and activities causing degradation of habitats, unsustainable activities, emissions of pollutants and release or spread of alien species and GMOs into the environment;
- Monitoring public opinion on issues of biodiversity and society's willingness to change the established behavioural patterns.

##### *8.8.4. Education, training and communication (partnership)*

Emphasis in the field of education and training is on educating trainers and teachers who, through the educational process and partnership between schools and public and professional institutions, spread knowledge and raise awareness among young people and the rest of the public on the relevance of biodiversity for the functioning of the ecosphere whose products represent the living conditions for our survival, by means of different projects and activities. This is also the basis for understanding the necessity of sustainable use of natural resources and of the cross-curricular field of environmental education.

In the field of education and training, the National Education Institute, working with the Ministry of the Environment and Spatial Planning and also independently, organised seminars for teachers on topics related to understanding the operation of living systems and their development (from an organism's cell to the population of an ecosystem and the ecosphere as a whole). This knowledge was upgraded by understanding the mechanisms of evolution that produce biodiversity. In this way, we contributed to advancing knowledge that facilitates understanding of conservation of the biodiversity that creates conditions for our survival. Understanding sustainable use of natural resources (including biodiversity) and sustainable development has been incorporated into the updated curricula, from the perspective of particular disciplines or subjects. We have been encouraging schools to work with professional institutions in nature conservation (the Ministry of the Environment and Spatial Planning, parks, regional institutions for nature and other institutes) through project activities, natural-science days and other activities. Every year since 2000, the Ministry of the Environment and Spatial Planning and the National Education Institute have prepared proposals for awareness rising of young people and the wider public and invited all schools to take part.

In 2008, the National Education Institute organised an international conference entitled "Biological Science and Society, Ecosystems – Interaction of Living Systems", dealing with biodiversity at all levels of organisation in the living environment. The papers presented at the conference made up a publication entitled "International Conference on Biodiversity". In this way, each year we have increased awareness of 300 to 400 interested educators on the relevance of biological diversity, and acquainted them with potential activities for assisting in conservation of biodiversity and its functions. They have been passing this knowledge to young people through their work.

In the field of education, curricula for biology have been updated so that a greater emphasis is now placed on an integrated approach to treating living systems at all levels of organisation in the living environment, on their interaction and mechanisms that generate biodiversity, which facilitates more successful understanding of the relevance of biodiversity and the search for appropriate activities to assist in conservation of biodiversity and its functions. The curriculum covering the cross-curricular field of environmental education has been updated and now also covers sustainable development. Education and training for all professions have been organised within environmental education. Thus knowledge of how to contribute to conservation of biodiversity within professions affecting the natural environment has been improved.

Organised education and training seminars and courses, supporting material for participants (e.g. the previously mentioned publication of conference papers), seminars for teachers and mentors, activities carried out at schools and reports of mentors on awareness-raising activities serve as indicators for performance assessment.

Besides pursuing the planned activities aimed at training education providers in the systemic approach to the living environment and conserving biodiversity within the international conference and as part of the introduction of the updated curricula, training for teachers on the topic of biodiversity will be carried out on all levels of organisation in the natural environment. This will contribute to pursuing and upgrading awareness of the relevance of biodiversity and the selection of appropriate activities for its conservation.

The Ministry of the Environment and Spatial Planning, protected areas and particular sectoral fields have been participating successfully in awareness-raising activities.

Thus, for example, the results of investigations on the status of animal genetic resources in Slovenia have been published in expert publications, and some are also published on the website of the Department of Zootechnology of the Biotechnical Faculty of the University of Ljubljana. Every year, a one-day public expert workshop is organised on the topic of animal genetic resources. In 2003, Pošta Slovenije included in the programme of commemorative postage stamps for the year a set of stamps from the Fauna series featuring Slovenian indigenous breeds of domestic animals: Cika cattle, Jezersko-Solčava sheep, Krško polje pig, Styrian hen – Štajerka. The Department of Zootechnology of the Biotechnical Faculty of the University of Ljubljana prepared a description and picture for each. Since 2005, when, on the initiative of the SAVE organisation, the European day of Agrobiodiversity was first celebrated, a number of expert contributions have been prepared, and have now been published at [http://www.bfro.uni-lj.si/Kat\\_center/genska\\_bank/gradiva.htm](http://www.bfro.uni-lj.si/Kat_center/genska_bank/gradiva.htm).

### Sustainable Use of Biodiversity: Awareness-raising and Communicating with the Public in Agriculture

Objective (2001)	Measure	Indicator	Modification/Status 2009	Strategic Directions
To increase the number of environmentally aware interest groups that understand the importance of biodiversity and are familiar with activities that conserve, or potentially threaten, biodiversity.	<p>Effective informing of the public to increase the public's general awareness and transparency of RDP operation, and to increase interest in using financial assistance for specific measures. Effects are measured through the computer database.</p> <p>Awareness-raising, informing the public on the relevance and status of conservation and promoting conservation of biodiversity in livestock farming. Designing the website on the activities of the gene bank in livestock farming. Expert assistance in organisation of exhibitions of indigenous and traditional breeds of domestic animals. Expert lectures – rural development programme and measures (rearing local breeds, well-being of livestock, etc.).</p>	<p>Effectiveness of informing and public reactions are monitored through the number of: instructions for partners in the system, press releases, press conferences, clippings, publications (leaflets, brochures, etc.) website visits, seminars and workshops, enquiries (visits, calls, e-mail) at INFO points.</p> <p>Published data on the status of biodiversity of livestock, number of expert contributions on the relevance of conserving biodiversity in livestock breeding, quantity of prepared expert and information material.</p> <p><b>Regular and prompt supplementing of the existing website with material of current interest and use of new tools.</b></p>	<p>Numerous articles and reports on the status of animal genetic resources in different publications and websites.</p>	Efforts to increase the number of people aware of the relevance of conserving biodiversity in agriculture through full implementation of described methodological measures.

## STRATEGIC DIRECTIONS

- To enforce state policy in the field of awareness raising and promoting education on all aspects of biodiversity;
- To develop programmes for informing, educating and raising the awareness of the public about the conservation and sustainable use of biodiversity, and to coordinate these activities;
- To set up an appropriate system for informing and supporting participation of individuals in biodiversity-conservation activities, and for encouraging wise and sound use of natural resources;
- To incorporate purposeful communication in activities involved in conservation of biodiversity and sustainable use of its components; consequently, intersectoral communication and communication with local populations should improve;
- To organise campaigns and other awareness-raising activities within all sectors concerned with biodiversity;
- To train staff involved in the implementation of the biodiversity-conservation strategy at the local, national or international level;
- To reward economic and social actors for achievements in the field of biodiversity conservation.

### ***Objectives for sustainable use of biodiversity: education and training***

The main objective in education and training related to sustainable use of biodiversity is to guarantee the specific technical knowledge required for conservation of biodiversity among all actors who professionally intervene in or affect biodiversity. The need to develop integrated knowledge on the living environment and approaches to this area is significant. Consequently, activities have been directed into providing expert knowledge of systemic biology that offers expert knowledge for seeking solutions aimed at conserving biodiversity. This knowledge was integrated in the updated curricula and educational activities. Moreover, opportunities for financing projects to be implemented by the National Education Institute in partnership with the respective discipline from the university and teachers were sought. Unfortunately, we did not succeed in securing these funds.

As a further step, professional training of key actors in education (teachers) will require enhancing to guarantee a satisfactory level of general biology education that provides knowledge on the environment, biology and biodiversity at all stages of the education process. During the last 20 years, the volume and status of knowledge on the living environment and evolution has been considerably curtailed in both primary schools and in secondary education. Thus, further pursuit of activities aimed at guaranteeing the right of access of all citizens to general knowledge on the living environment, with emphasis on knowledge facilitating appropriate understanding of conservation of biodiversity and its functions, is required.

### Objectives for Sustainable Use of Biodiversity: Education and Training

Objective (2001)	Measure	Indicator	Modification/Status 2009	Strategic Directions
To guarantee specific technical knowledge required for conservation of biodiversity for all actors who professionally affect biodiversity.	Updating curricula for the subject of biology and educational activities.  All those participating in the programme of agri-environmental payments have to pass, within a period of five years, a specific training programme involving a determined number of hours.	Training (300–400 participants) carried out for the purpose of developing and attaining comprehensive understanding of the way the living environment functions and raising awareness on the integration of people in the web of life on earth, on which they depend.  After attending training, participants obtain a certificate on the content, trainer and number of hours spent in the training process.	Improved understanding of expert knowledge in the field of biodiversity and advanced material to aid training and awareness-raising.  Conditions apply to all involved in agri-environmental measures by 2013.	Efforts aimed at reinstating opportunity to develop appropriate general knowledge on the living environment and specific biological knowledge on conservation of biodiversity at all levels of education.  Conditions apply to all those involved in agri-environmental measures by 2013.
To guarantee a satisfactory level of general biology education providing knowledge on the environment, biology and biodiversity at all stages of the education process.	Activities aimed at asserting the necessity of setting up proper access to advanced general biological education or reinstating the volume of biology that existed before the reform and introduction of nine-year primary schooling.	Updated curriculum should re-introduce functional mechanisms of organisms, ecosystems, genetics and other knowledge on the functioning of living organisms or their cells, population, ecosystems and ecosphere. Only part of the task of achieving systematic regulation of access to full biological education in primary schooling, vocational training and other levels of education has been implemented.	In high-school education, training of biology teachers for integrated teaching of understanding of the living environment and the importance of the conservation of biodiversity generated by evolution has been carried out.	Guaranteeing the right of access of all citizens to general knowledge on the living environment with emphasis on knowledge facilitating appropriate understanding and conservation of biodiversity and its functions.

## STRATEGIC DIRECTIONS

- To improve the current level of quality and extent of natural-science programmes that contribute to understanding of the functioning of biodiversity, in particular biology programmes, in all schools;
- To define the minimum range of common curriculum themes and integrate into them nature-protection or biodiversity issues at all levels of the formal education process;
- To monitor implementation of environmental and nature-protection education programmes and to evaluate their effects;
- To include convention issues in graduate and post-graduate theses;
- To prepare and support programmes of interdisciplinary training and specialist training of nature-conservation staff, in particular for project management, management tasks and on communicating with the public and other relevant target groups.
- To draw up programmes for interdisciplinary training of disseminators of knowledge on nature-protection, in particular teachers, agricultural advisers, non-governmental organisations, public water management and forestry services and employees of tourist companies and organisations, to educate interested groups (e.g. owners and managers) and raise their awareness;
- To promote continuous adult education in nature conservation and environmental protection;
- To establish and promote development of research and interdisciplinary environmental-education centres;
- To support cooperation with and between companies and non-governmental organisations in awareness-raising, education, training and other forms of communication.

### *8.8.4.1. Objectives for sustainable use of biodiversity: communicating (partnership)*

The main objective set in 2001 was promoting decision-making based on available information, comparing information and knowledge, upgrading and integrating knowledge, and preventing unnecessary duplication of work. In the education process below university level, projects were implemented that encouraged cross-curricular integration of topics to improve communication (an interdisciplinary approach) and development of critical thinking, independent judgment and decision-making at the personal and social levels. The indicator in this field included published educational materials and advanced training and education offered on the living environment, consideration of evolution, and the functioning and interaction of the web of life in approaching and planning sustainable development. The result is improved cooperation between subject disciplines and a culture of professional coordination in the common areas supplemented by their aspects. We now aim to facilitate better access to education, training and learning, and coordination of aspects of different disciplines related to sustainable development among trainers.

## STRATEGIC DIRECTIONS

- To promote participation of all sectors, governmental, non-governmental, expert and scientific organisations, individuals, local communities, public media and other CHM users as information suppliers or users;
- To establish control over legislation, strategic documents, projects, databases and mechanisms concerning biodiversity;
- To coordinate databases with information on biodiversity;
- To set priorities concerning research and education in the field of biodiversity on the basis of available and requested information;
- To link knowledge with information and to ensure the necessary data for inquiries related to enforcement of the convention at the national and international level;
- To guarantee informing of the public and public participation in decision-making procedures concerning environmental-impact assessments by establishing an

- internationally comparable and publicly accessible information system;
- To establish a clearing-house mechanism to implement the Protocol on Biosafety pursuant to the mandatory provisions of the convention.

## 8.9. Other national strategies and initiatives

In 2006, the European Commission adopted the Communication on Halting the loss of biodiversity by 2010 and beyond, and the EU Action Plan, which calls upon EU Member States to meet the biodiversity objective. Slovenia has not adopted any planning act for meeting the 2010 objective, but in October 2007, the Ministry of Agriculture, Forestry and Food and the Ministry of the Environment and Spatial Planning signed the Countdown 2010 Declaration. With this, the ministries acceded to the IUCN Greenbelt initiative, highlighted several concrete tasks and objectives, and committed themselves to "halt or significantly reduce the current rate of biodiversity loss by 2010" at the national level.

### 8.9.1. Countdown2010

#### Slovenia's commitments in the Countdown 2010 Declaration:

- Launch the Slovenian Countdown 2010 initiative on 16 October 2007 to further position and strengthen the contribution of Slovenia to the 2010 biodiversity target;
- Strengthen understanding and management of biodiversity, in particular focusing on endemic and endangered species, which are an essential feature for halting the loss of biodiversity given the richness of biodiversity in Slovenia;
- Establish new and efficiently manage existing protected areas to contribute to the European and global network of protected areas by:
  - expanding existing transboundary collaboration in order to ensure a coherent transboundary network of protected areas,
  - further developing and implementing nature-conservation measures of the **Natura 2000 Site Management Programme (Operational Programme 2007–2013)** on existing and planned protected areas;
- Ensure implementation of the Slovenian National Biodiversity Strategy and especially the **Natura 2000 Site Management Programme (Operational Programme 2007–2013)**, the major Slovenian contribution to the 2010 biodiversity target, and report on concrete actions and indicators showing progress towards halting the loss of biodiversity by 2010, for instance:
  - achieving the set targets in relation to surface area under agri-environmental measures,
  - fully including actions in sectoral management plans,
  - achieving set targets on nature-protection measures,
  - establishing the planned monitoring system;
- Establish a monitoring system that will allow for continuous review of the status of biodiversity and progress in the implementation of international commitments;
- Ensure involvement of relevant local authorities, non-governmental organisations and other stakeholders in relation to implementation and raising awareness of the 2010 biodiversity target;
- Promote to other countries close-to-nature forest management as a means of achieving the 2010 biodiversity target, based on the Slovenian experience, including profiling this during CBD CoP9 and other relevant fora;
- Prepare examples of good practice on use of wood biomass on biodiversity with particular attention to close-to-nature forest management;
- Connect biodiversity and forest issues during the Slovenian Presidency in early 2008 to ensure coherence at the European and international levels between these issues and their relation to climate change, sustainable use and other matters;



- Ensure that the 2010 target is on the agenda of the EU Forest Directors and the EU Nature Directors meeting to ensure coordinated efforts in linking forest and biodiversity agendas;
- Intensify the engagement of business in the biodiversity agenda and follow up on the outcomes of the Portuguese Presidency in relation to a European business and biodiversity initiative;
- Sustain existing Countdown 2010 processes at international, European and national levels, in areas such as the marine environment, forest protection and development cooperation, to ensure implementation of the European Commission Biodiversity Communication and other international commitments;
- Strive to attend the World Conservation Congress in Barcelona in October 2008 with a Countdown 2010 commitment on a marine protected area;
- Organise an international conference in Slovenia in 2010 on karst biodiversity and ensure that biodiversity aspects and the 2010 target have a high profile at the conference;
- Ensure to pass responsibility for Countdown 2010 and previous European commitments on the 2010 biodiversity target to the upcoming triple Presidency of France, Czech Republic and Sweden;
- Profile and report to the Countdown 2010 Secretariat on the status of implementation of these commitments on 22 May of each year.

Ljubljana, 16 October 2007

The results of the objectives set in the Countdown 2010 Declaration show that the latter have been implemented only partially. Although they have contributed to the conservation and sustainable use of biodiversity, Slovenia has not attained the target of halting the decline of biodiversity. However, implementation of these commitments has to be continued to attain long-term objectives.

### ***8.10. Implementation of international conventions important for conservation of biodiversity***

**OBJECTIVE:**

- To strengthen international cooperation and improve results at particular levels and between them.

#### 3.3.1 Biodiversity-related conventions

The Slovenian Constitution determines that laws and other regulations must comply with generally accepted principles of international law and with international treaties and conventions ratified by the Slovenian National Assembly that are binding on Slovenia. This establishes an internal hierarchy of legal acts in Slovenian legislation that generally accepted principles of international law and ratified international conventions prevail over laws and other regulations and the latter must comply with the former.

The Slovenian Constitution also determines that ratified and published treaties **shall be applied directly**. Slovenia ratified all relevant treaties and conventions referring to conservation of nature. Thus they have become part of the Slovenian legal order. The Nature Conservation Act thus transposed into Slovenian legislation the substance of the ratified international treaties. Some of these refer to the regulation of subject matter in the law or in the implementing regulations.

The most important ratified international treaties regulating conservation of nature and defining basic nature-conservation principles are the following:

GLOBAL LEVEL		
<i>The Convention on Wetlands of International Importance, especially as waterfowl habitat – Ramsar Convention (Ramsar, 1971).</i>		Notified in 1992 (Official Gazette RS, no. 15/92).
<i>The Convention Concerning the Protection of the World Cultural and Natural Heritage – the World Heritage Convention (Paris, 1972).</i>		Notified in 1992 (Official Gazette RS, no. 15/92).
<i>The Convention on International Trade in Endangered Species of Wild Fauna and Flora – CITES (Washington, 1973).</i>		Ratified in 1999 (Official Gazette RS-MP, no. 31/99, Official Gazette RS, no. 110/99).
<i>The Convention on the Conservation of Migratory Species of Wild Animals CMS – Bonn Convention (Bonn, 1979).</i>		Ratified in 1998 (Official Gazette RS-MP, no.18/98, Official Gazette RS, no. 72/98).
<i>Agreement of the Conservation of African-Eurasian Migratory Waterbirds – AEWA (1995).</i>		Ratified in 2003 (Official Gazette RS-MP, no. 16/03, Official Gazette RS, no. 16/03).
<i>Agreement on the Conservation of Bats in Europe – EUROBATS (1991).</i>		Ratified in 2003 (Official Gazette RS-MP, no. 22/03, Official Gazette RS, no. 102/03).
<i>Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic Area – ACCOBAMS (1996).</i>		Ratified in 2006 (Official Gazette RS-MP, no. 16/06, Official Gazette RS, no. 82/06).
<i>The Convention on Biological Diversity (Rio de Janeiro, 1992).</i>		Ratified in 1996 (Official Gazette RS-MP, no.7/96, Official Gazette RS, no. 30/96).
<i>Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean – Barcelona Convention (Barcelona, 1976).</i>		Ratified in 1993 (Official Gazette RS-MP, no.13/93, Official Gazette RS, no. 44/93).
<i>Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean (Barcelona, 1995).</i>		Ratified in 2002 (Official Gazette RS-MP, no. 26/02, Official Gazette RS, no. 102/02).
<i>International Convention for the Regulation of Whaling</i>		Ratified in 2006 (Official Gazette RS-MP, no. 15/06,

<i>(Washington, 1946).</i>		Official Gazette RS, no. 73/06).
<i>International Dolphin Conservation Program (IDCP)(Washington, 1998).</i>		Ratified in 2006 (Official Gazette RS-MP, no. 20/06, Official Gazette RS, no. 114/06).
<b>EUROPEAN LEVEL</b>		
<i>The Convention on the Conservation of European Wildlife and Natural Habitats – Bern Convention (Bern, 1979).</i>		Ratified in 1999 (Official Gazette RS-MP, no. 17/99 – Official Gazette RS, no. 55/99).
Convention on the Protection of the Alps – Alpine Convention (Salzburg, 1991).		Ratified in 1995 (Official Gazette RS-MP, no. 5/95, Official Gazette RS, no. 19/95).
	Protocols of the Alpine Convention on spatial planning and sustainable development, conservation of nature and landscape protection, mountain farming, mountain forests, tourism, energy, soil conservation, transport and settlement of disputes.	Ratified in 2003 (Official Gazette RS-MP, no. 28/03, Official Gazette RS, no. 123/03).
<i>European Landscape Convention – Florence Convention (Florence, 2000).</i>		Ratified in 2003 (Official Gazette RS-MP, no. 19/03, Official Gazette RS, no. 74/03).

The majority of these conventions refer to the conservation of wild plant and animal species and their habitats. These conventions include, in addition to the Convention on Biological Diversity, also the Ramsar Convention, the Bern Convention, the Bonn Convention and the **International Convention for the Regulation of Whaling**. The Alpine Convention also has a similar indirect effect, although it is very general in nature. However, its implementing acts and protocols for particular fields are more concrete. The World Heritage Convention regulates the traditional conservation of nature as conservation of designated parts of nature. Also relevant at the regional level are the Barcelona Convention and its protocol concerning specially Protected Areas and Biological Diversity in the Mediterranean, and the Danube River Protection Convention (Danube Convention) that connects the states around the Danube and offers legislative grounds for implementation of national hydrological activity.

#### 8.10.1. Other relevant treaties

Strengthening of international cooperation and improving results at particular levels and between them is reflected in individual areas, in particular in agriculture and forestry (FAO, CBD, CSD, etc.). It is reflected in partnerships with international organisations in the area of conserving biodiversity, the number of international projects and participation in international meetings in the area of conserving biodiversity in agriculture and forestry.

In the field of biodiversity conservation in livestock farming, Slovenia primarily works alongside the following international organisations: FAO, ERFP, EAAP, DAGENE and SAVE. A report on the current situation and activities with respect to animal genetic resources in Slovenian agriculture is annually submitted to ERFP and published on its website:

<http://www.rfp-europe.org/template02.php?lang=EN&id=1703>.

## STRATEGIC DIRECTIONS

- To strengthen cooperation with international institutions and individual projects by exchanging information and good practice;
- To present successful examples of biodiversity conservation and sustainable use of its components to the international public;
- To develop priority fields of international cooperation (*Convention Thematic Areas*): forest ecosystems, inland waters and wetlands, invasive alien species, tourism, genetically modified organisms.

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