

National Strategy for the Conservation of Biodiversity in 2015-2020

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EXECUTIVE SUMMARY

Biodiversity refers to the diversity of life on Earth and ecosystems. The natural resources of Hungary represent outstanding values even in a European comparison, our varied ecological features are favourable for biodiversity. However, unfortunately the European tendencies of biodiversity also occur in Hungary and large companies often prevail over small and medium-sized enterprises and therefore short-term economic interests dominate over medium and long-term environmental, social and economic interests. Maintaining biodiversity is a key factor in providing the conditions of human life and human well-being. Biodiversity offers ecosystem services that are indispensable for human life: it provides the ecological basis of healthy food, clear fresh water and pure air, offers a habitat and raw material for medical drugs to us, is involved in the prevention and mitigation of the impacts of disasters, epidemics and diseases, as well as in climate regulation.

Pursuant to the provisions of the UN Convention of Biological Diversity, each signatory state, also including Hungary, must develop a national strategy for the conservation and sustainable use of biodiversity. As the term of the currently effective biodiversity conservation strategy of Hungary expires in 2014, this strategy had to be reviewed and revised. Other international and EU commitments were also adopted which must be integrated in the national planning processes in line with the specificities of each signatory state.

The new National Strategy for the Conservation of Biodiversity in 2015-2020 (hereinafter referred to as: National Biodiversity Strategy) intends to halt the loss of biological diversity and further decline of ecosystem services in Hungary by 2020 and to improve their status as much as possible. In order to achieve that, the aspects of preserving biodiversity must be integrated into cross-sectoral policies, strategies and programmes and in their implementation.

The objectives of the National Biodiversity Strategy were defined on the basis of the status assessment presenting the main characteristics of the affected (speciality) areas and the main tendencies relating to biodiversity.

Focusing on the outlined future vision and aligning to a certain extent to the strategy of EU biodiversity strategy, the National Biodiversity Strategy emphasises six areas: protection of areas and species subject to nature conservation; maintenance of landscape diversity, green infrastructure and ecosystem services; agriculture-related issues; sustainable forest and game management and protection of water resources; combating invasive alien species (non-indigenous species); as well as Hungary's role in the fulfilment of obligations arising from international biodiversity protection agreements. Within these strategic areas, twenty objectives concentrate on managing the Hungarian problems of biodiversity protection. Each objective involves several specific goals, the implementation of which is supported by measures, while monitoring is assisted by indicators. The National Biodiversity Strategy also identifies the actors and responsible institutions involved in its implementation.

An interim evaluation will be prepared on the implementation of the National Biodiversity Strategy in 2017 and within one year after the end of the implementation period, in 2021.

1 INTRODUCTION

1.1 Background of the Strategy

1.1.1 Motive and Mandate

Hungary signed the Convention on Biological Diversity in the year when it was adopted i.e., in 1992 and then Parliament decided to proclaim and recognise it with Act LXXXI of 1995. Pursuant to the provisions of the Convention, each signatory state, also including Hungary, must develop a national strategy for the preservation and sustainable use of biodiversity.

Parliament approved Hungary's **first Biodiversity Preservation Strategy (2009–2014)** as an annex to the third National Environmental Programme, but **its term expired in 2014**, and therefore **the strategy had to be reviewed and revised**.

Another reason for creating a new national strategy for the preservation of biodiversity for the period of 2015-2020 (hereinafter referred to as: **National Biodiversity Strategy**) is that, parallel with the continued loss of the diversity of ecosystems, major international and EU commitments were adopted which must be integrated into the national planning processes in line with the characteristics of the individual countries.

Consequently, Hungary also needs to contribute to the attainment of the **objectives of the Strategic Plan for Biodiversity (2011-2020)**¹ and define its national objectives accordingly. In addition, Hungary must also comply with the **Biodiversity Strategy of the European Union, effective until 2020**², adopted in June 2011 during the Hungarian presidency. The objective of the European Union is to stop the reduction of biodiversity and degradation of ecosystem services by 2020 and to restore their condition as much as possible. In addition, it intends to increasingly contribute to reducing the global loss of biodiversity i.e., it intends to take a leading role in biodiversity also on international scale.

The National Biodiversity Strategy (2015-2020) is primarily a **complex strategy** for the preservation and sustainable use of Hungary's biodiversity that must be adopted as an **individual document** satisfying the EU criteria. The objectives of this Strategy must be in line with the 4th National Environmental Programme, and must mutually support the implementation of one another. The practical nature conservation issues of the National Biodiversity Strategy are included in the 4th National Nature Conservation Basic Plan. The National Biodiversity Strategy is closely related to the National Sustainable Development Framework Strategy approved by Parliament as a long-term concept; of the four basic resources discussed in that concept it primarily determines objectives and measures relating to natural resources and biodiversity.

The elaboration and consultations of the National Biodiversity Strategy (2015-2020) comply with the provisions of Government Decree No. 38/2012. (III. 12.) on strategy management by the Government.

¹ Strategic Plan for Biodiversity 2011-2020: <http://www.cbd.int/sp/>

² EU Biodiversity Strategy to 2020 (COM(2011) 244 final)

1.1.2 Authors of the Strategy

The Hungarian, EU and international coordination tasks relating to the Convention on Biological Diversity are performed by the Ministry of Agriculture, and the same Ministry is responsible for developing the National Biodiversity Strategy for 2015-2020.

The Strategy was planned and built primarily through the active involvement of the competent departments of the Ministry of Agriculture and certain background institutions of the Ministry.

Two round-table discussions were organised during the working process in order to provide information and present and understand different use and opinions. The discussions were attended, among others, by the Deputy for the Commissioner for Fundamental Rights responsible for the Protection of the Interests of Future Generations, the National Sustainable Development Council, the Parliamentary Commission for Sustainable Development and other non-governmental organisations³.

Within the framework of the public administration and social consultation of the draft strategy, a national conference was also organised.

1.2 The Planning Process

1.2.1 Applied Methodology

The National Biodiversity Strategy (2015-2020) was developed on the basis of Government Decree No. 38/2012. (III. 12.), by taking into account the aspects of the technical policy and strategic guide, prepared for the strategic planning documents.

A national consultation took place in November 2012⁴ prior to strategic planning, with the involvement of representatives of the Government, NGOs and scientific organisations. This consultation was an ideal opportunity for learning about international obligations concerning the preservation of biodiversity and contributed to the identification of problems relating to the promotion of biodiversity preservation and for defining the cause and effect relationship between problems.

In the framework of the public administration and social consultation of the draft strategy, a national conference was also organised⁵ in cooperation by the Ministry of Agriculture, the Parliamentary Committee for Sustainable Development, the National Sustainable Development Council, the Office of the Commissioner of Fundamental Rights and the Association of National Society of Conservationists, providing an opportunity for presenting to the public any remark concerning the draft.

The status analysis and evaluation present the main characteristics of the (speciality) areas affected by the objectives of the National Biodiversity Strategy and the main tendencies relating to biodiversity. The strengths, weaknesses, opportunities, and threats of the preservation of biodiversity in Hungary were analysed on the basis of the detailed status analysis (SWOT analysis), which relied, among others, on the discussion paper containing NGO proposals for the revision of the National Biodiversity Strategy⁶.

³ Round-table discussions (Office of the Commissioner of Fundamental Rights, 23 April 2013 and 10 July 2013)

⁴ National conference to promote the preservation of biodiversity (MRD, Darányi Ignác Room, 8 November 2012)

⁵ National conference: Dialogue on the draft of the National Biodiversity Strategy (2014-2020) (MRD Darányi Ignác Room, 30 October 2013)

⁶ http://www.mtvsh.hu/dynamic/nbs_civiljavaslat_30oldal.pdf

The future vision of the National Biodiversity Strategy was developed in accordance with a main requirement of being in line with the commitments already undertaken at international and EU level and to handle the problems identified during the SWOT analysis.

Another requirement was to ensure that the National Biodiversity Strategy aligned, within reason, with the EU biodiversity strategy until 2020, with sufficient emphasis on the special features of the sectors and disciplines that are the most important in terms of Hungary's main environment, social and economic, as well as biodiversity aspects. Focusing on the national future vision for 2020, 6 strategic areas were identified, within which 20 objectives concentrate on the management problems of biodiversity protection in Hungary. Each objective is broken down into several goals, the implementation of which is supported by specific measures, while monitoring is assisted by indicators. The actors and responsible institutions involved in the implementation of the strategy have already been identified.

1.2.2 Definitions and delineation

Biodiversity refers to the diversity of life on Earth and ecosystems and maintaining biodiversity however is a key factor in providing the conditions of human life and human well-being. Biodiversity includes diversity of the ecological systems of mainland and waters and the (genetic) diversity between and within species.⁷ Biodiversity offers ecosystem services that are indispensable for human life: it provides the ecological basis of healthy food, clear fresh water, pure air, offers a habitat and raw material for medical drugs to us, is involved in the prevention and mitigation of the impacts of disasters, epidemics and diseases, as well as in climate regulation.

The term of this policy related strategy is the **period between 2015-2020**, which is in line with the respective international and EU strategies and the financial planning cycle of the European Union.

2 STATUS ANALYSIS AND ASSESSMENT

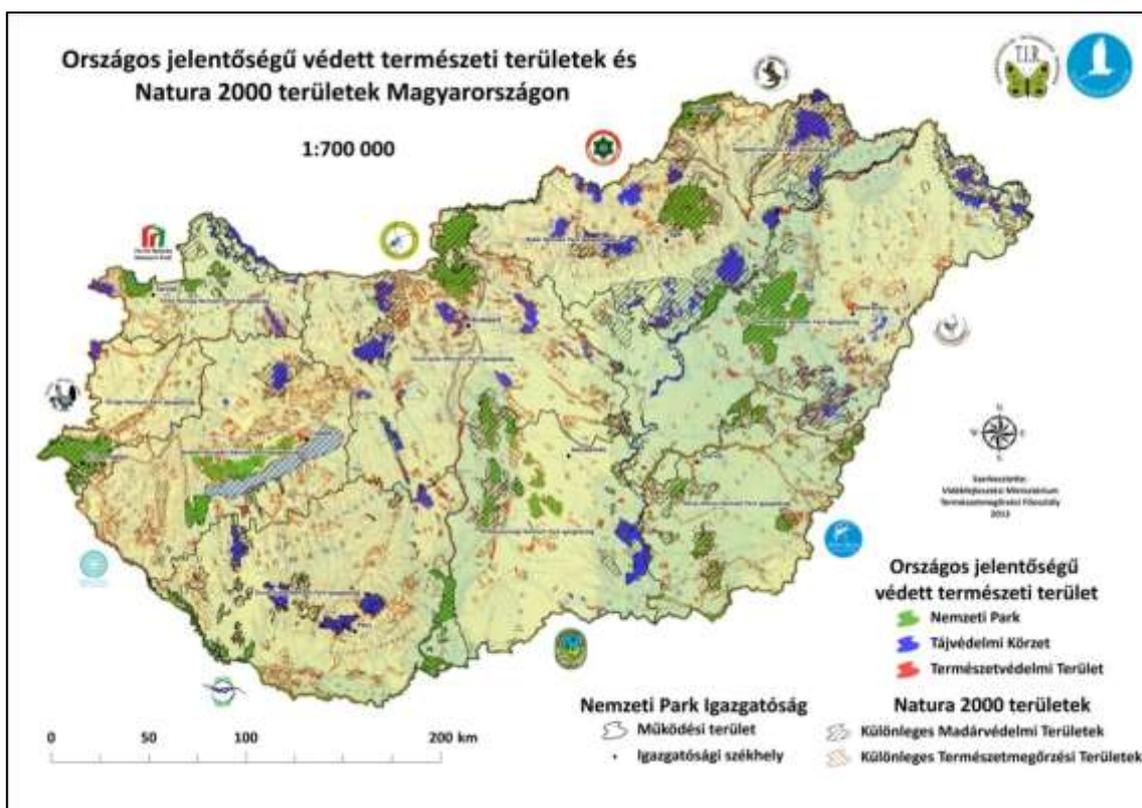
2.1 Detailed status analysis

Below we present the main features and tendencies related to biodiversity in relation to the twenty objectives of the National Biodiversity Strategy.

2.1.1 Status of areas, species and habitats subject to nature conservation and their nature conservation status

It reflects Hungary's abundance in natural resources that **22.2% of Hungary's territory** (2,067,876 hectares) **are subject to national or EU protection**. The majority of this area (approximately 1.9 million hectares, 21.39%) are Natura 2000 sites, designated on the basis of two nature conservation Directives of the European Union, the Birds Directive (2009/147/EC, the re-codified version of 79/409/EEC) and the Habitats Directive (43/92/EEC), and nearly half of it (848,140 hectares, 9.108%) are protected nature conservation areas of national importance (map 1).

⁷ <http://www.biodiv.hu/convention/F1117799202>



Map 1.: Protected nature conservation areas of national importance and Natura 2000 sites in Hungary (Source: Ministry of Agriculture)

<i>Országos jelentőségű védett természeti területek és Natura 2000 területek Magyarországon</i>	<i>Protected nature conservation areas of national importance and Natura 2000 sites in Hungary</i>
<i>Nemzeti Park Igazgatóság</i>	<i>National Park Directorate</i>
<i>Működési terület</i>	<i>Area of operation</i>
<i>Igazgatósági székhely</i>	<i>Directorate seat</i>
<i>Országos jelentőségű védett természeti terület</i>	<i>Protected nature conservation area of national importance</i>
<i>Nemzeti Park</i>	<i>National Park</i>
<i>Tájvédelmi Körzet</i>	<i>Nature Conservation Area</i>
<i>Természetvédelmi Terület</i>	<i>Nature Protection Area</i>
<i>Natura 2000 területek</i>	<i>Natura 2000 sites</i>
<i>Különleges Madárvédelmi Területek</i>	<i>Special Bird Protection Sites</i>
<i>Különleges Természetmegőrzési Területek</i>	<i>Special Nature Conservation Sites</i>

In Hungary there are approximately 2,200 higher category plants (vascular plant species) and approximately 42,000 animal species live in Hungary. The number of species of large fungi, living in our forests, meadows, wetlands and in the direct neighbourhood thereof is currently estimated at 3,000-3,500. One-third of the large fungus species are not capped mushrooms, but belong to mushroom groups of various appearances (elf caps, star and coral mushrooms, puffballs, truffles, etc.). Of the species making up our fauna and flora 1,901 are under nature conservation protection. Of the wild plant and animal species living in Hungary 733 and 1,168 species are protected and 87 and 186 species are strictly protected. Apart from the plant and animal species, 58 mushroom species and 17 lichen species are protected by law.

With Hungary's accession, a new, Pannonian biogeographic region was added to the territory of the European Union, which covers the whole territory of Hungary. Numerous species of Community importance live in the Pannonian biogeographic region that do not occur at all on the territory of the former Member States. Although the Pannonian region covers only 3% of the EU territory, it is home to 226 species (17%) of the 1,301 animal and plant species

included in the annexes of the Habitats Directive and to 278 species (36%) of the 768 bird species falling within the scope of the Birds Directive.

The nature conservation status of species and habitat types, used as the basis of the Natura 2000 network, which covers more than 90% of the protected natural areas of national significance, as well as of those included in the annexes of the Habitats Directive reflects well the current status of our natural areas and values, as well as the changes taking place in the recent past. Since the 2007 six-year report, it indicates some progress that these days there is no habitat of Community importance whose conservation status remains unknown (Figure 1) and the ratio of habitat types in a favourable conservation status has also gone up from 11% to 19%. The nature conservation status has improved for more than 50 percent of the habitats. However, the ratio of **habitat types of Community importance with an Unfavourable inadequate and Unfavourable bad nature conservation status is still higher than 80%**. It also applies to **species of Community importance** that the lack of information has reduced over the recent years, although the nature conservation status of 2% of the species is still unknown. In total, more than half, almost **62% of the species have inadequate or bad nature conservation status**, while the ratio of **species with a favourable nature conservation status is only 36%**.

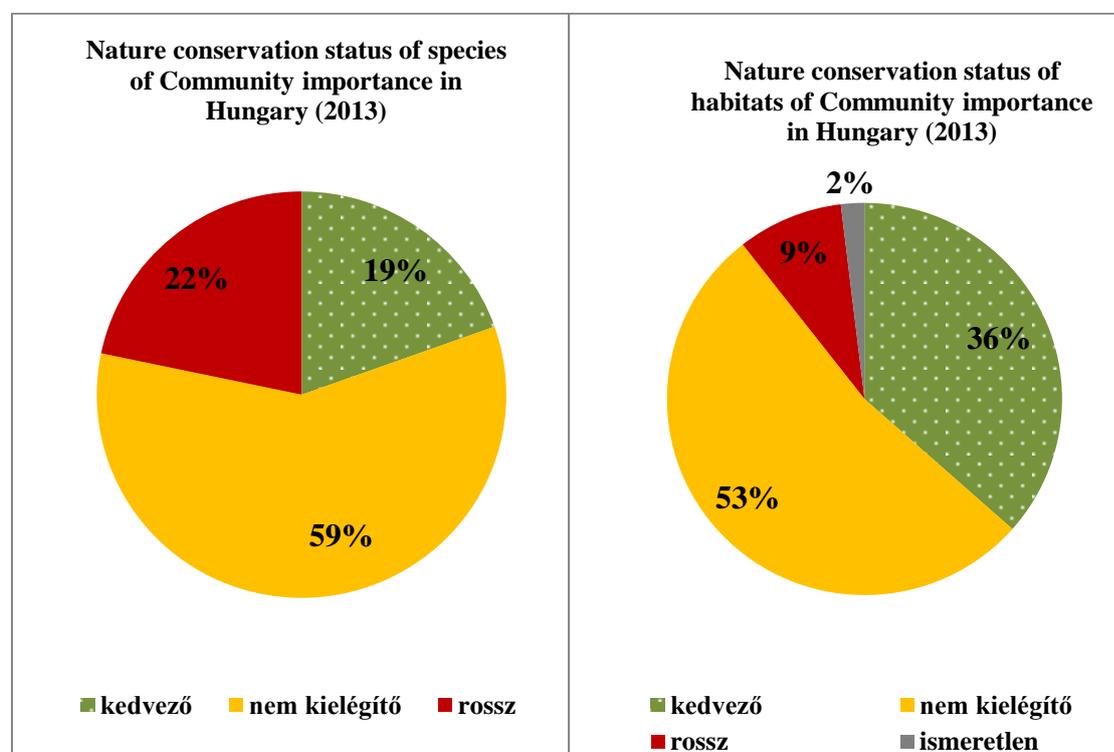


Figure 1.: Assessment of the nature conservation status of species and habitats of Community importance in Hungary (Source: Ministry of Agriculture)

<i>kedvező</i>	<i>favourable</i>
<i>nem kielégítő</i>	<i>inadequate</i>
<i>rossz</i>	<i>bad</i>
<i>ismeretlen</i>	<i>unknown</i>

The majority of the protected natural sites and the Hungarian Natura 2000 network is cultivated area, involved in arable land cultivation or forest management (25% of the Hungarian Natura 2000 network is agricultural area, vineyards or orchard, 27% is grassland and 38% is forest). In Hungary the ratio of grassland within the Natura 2000 network is more

than twice the EU average and its size exceeds 500,000 hectares. The size of arable land is similar, while forests take up 833,000 hectares⁸.

While certain areas used for agricultural purposes (grazing, mowing) are of key importance in terms of preservation of biological diversity in Hungary, the nature conservation status of habitats and species of Community importance in our country reflects their relatively bad status. In the Pannonian biogeographic region **the nature conservation status of all habitat types of community importance relating to areas used for agricultural purposes is bad or inadequate, while 72% of species of Community importance belong to these categories.** The most important reason for that is more intensive and large-scale agricultural farming.

The situation is similar in the case of forest ecosystems, which also depend a great deal on the economic activities, while it is slightly better in the case of species. **Among the species of Community importance relating to forest ecosystems in Hungary slightly more than 61% of the species, but 77% of the habitat types have an inadequate or bad nature conservation status.**

The populations of farmland **bird species have been declining** since 2005, following the relatively stable period of 1999-2005, and from 1999 a slight increase in the populations of forest **birds** indicate general biodiversity trends of the areas used for **agricultural cultivation and forest management**. A decline in forest birds can be observed only in 2005 and 2010, but the actual change can only be concluded over a longer term (Figure 2)⁹.

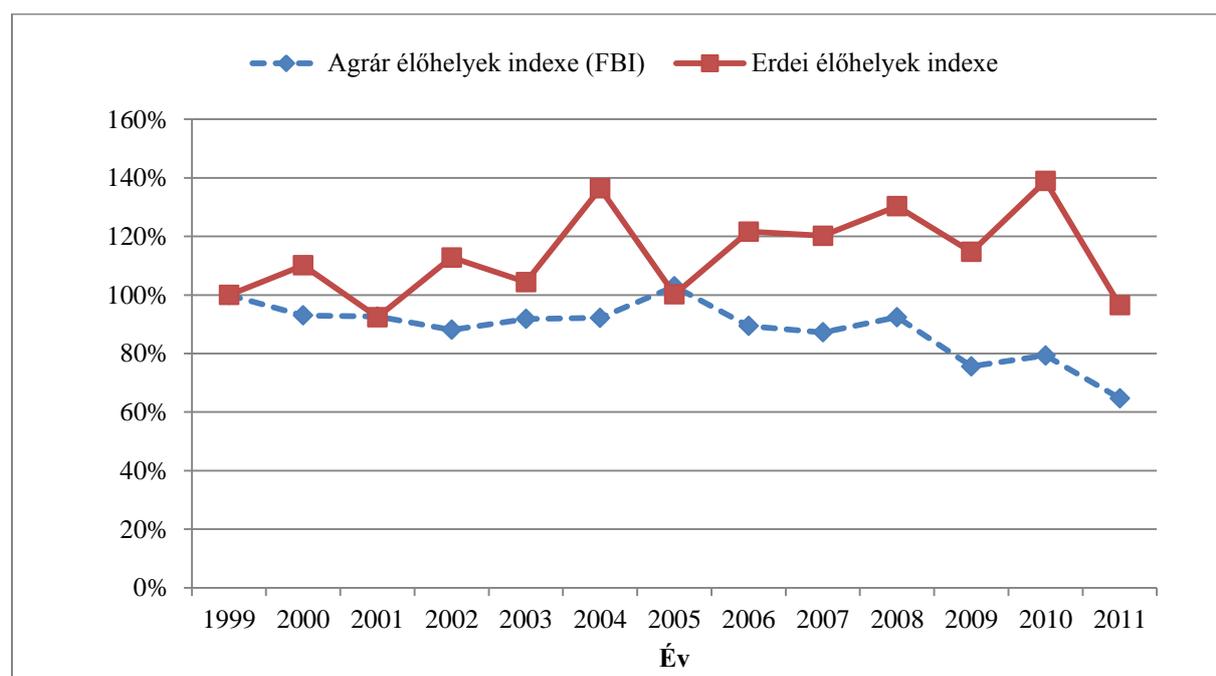


Figure 2.: Biodiversity indicator values (source of data: European Bird Counting Council [EBCC] list of species)

<i>Agrár élőhelyek indexe (FBI)</i>	<i>Agri-habitat index (FBI)</i>
<i>Erdei élőhelyek indexe</i>	<i>Forest habitat index</i>
<i>Év</i>	<i>Year</i>

⁸ National Forestry Database

⁹ Based on the results of the “Common Bird Census” bird survey conducted by the Hungarian Ornithological and Nature Conservation Society

Caves and artificial sub-surface cavities form a special group of protected natural assets deserving outstanding attention as they are special habitats of endemic cave species and other cave-dwelling animal species. The majority of the bat species living in Hungary cannot be preserved in the long term without adequate management of our caves either. In such especially sensitive complex and complicated systems even a small change in lifeless elements may make ecosystems collapse.

The impacts directly relating to economy (lack of economic activities or effects of any inadequate business practice) and impacts requiring active habitat protection and habitat development interventions (dissemination of invasive species, alteration of natural water balance, fragmentation of habitats) dominate the risk factors that threaten the natural assets of the protected natural areas and the Natura 2000 sites. As a result of economic activities, closely interrelated with the preservation of natural values and the extensive presence of people, the survival of numerous protected and strictly protected plant and animal species and/or those of Community importance depend on the availability of areas that are not subject to any intensive use and function as an ecological refuge (e.g., between arable land parcels or fragmented loess and grassland pieces on the side of the roads). Preserving these areas and their adequate management is the last resort for numerous species. Our *ex lege* protected natural areas (e.g., kurgans and hillforts) also have a key role in the preservation of species. The kurgans, which may be considered refuges of the former natural ecosystem in intensive agricultural areas, preserve the remaining fragments of our semi-natural grassland of the Great Plain.

A lot of active nature conservation measures were applied in relation to the majority of the risk factors in recent years, the impacts of which are likely to bring considerable improvement in the nature conservation status of species and habitats in the mid-term. With the help of the European Union funds made available between 2007 and 2013 (ERDF, LIFE) habitat reconstruction and development interventions took place on approximately 5% of the Natura 2000 sites and on approximately 10% of the protected natural sites of national importance, while the size of the Natura 2000 grassland, for which agricultural and environmental support is provided, has exceeded 250,000 hectares. Apart from the numerous habitat development interventions, which also contribute to the preservation of the endangered species, the targeted species preservation programmes launched in the LIFE programme need to be mentioned (e.g., *Dianthus diutinus*, Great Bustard, Danubian Meadow Viper, Saker Falcon, Eastern Imperial Eagle and Red-footed Falcon).

The planning documentation, including the Natura 2000 maintenance plans or equivalent planning documentation, protected natural area management plan documentation, etc., which are already available for numerous areas, assist the management of protected nature areas and Natura 2000 sites for nature conservation purposes.

Until 2013 in total 40 Natura 2000 maintenance plans were completed, mostly within the framework of EU applications (2006/18/176.02.01 Transition Support scheme, LIFE projects), affecting 41 Natura 2000 sites and areas. Maintenance plans will be prepared for further 243 Natura 2000 sites with support from the European Agricultural Fund for Rural Development until May 2015. Consequently, **in the spring of 2015 Natura 2000 maintenance plans will be available for 284 sites or parts of sites from the 525 Natura 2000 sites**. Within the framework of the Swiss-Hungarian Cooperation maintenance plans are also being prepared for 14 Natura 2000 sites covering more than 100,000 hectares.

Until May 2013 **management plans** were prepared and proclaimed in the form of legal regulations, for 7 landscape protection areas (51,102 ha) and 68 nature conservation sites (6,485 ha) representing **6.7%** of the protected natural areas of national importance. In

addition, **management planning documentation** was prepared for **further 60.3%** of the area, which is not binding, but is suitable for professional support to management for nature conservation purposes.

Apart from the planning documentation, which is the basis of area maintenance, the measures aimed at preserving the most threatened species (23 animal and 20 plant species) are summarised in species action plans; similar plans must be prepared in the future too.

The implementation of species preservation, management and maintenance plans do not only preserve endangered natural assets, but can also create jobs in more disadvantaged areas.

The indigenous wild plants have been preserved in an *ex situ* seed bank, known as Pannon Seed Bank, in Hungary since 2010 as a security supplement to protection in the natural habitat.

Increasing light pollution, which is a risk both in terms of ecology and nature preservation is a challenge. The negative impact of light pollution of biodiversity can be observed in the disruption of the orientation abilities of animal species, primarily invertebrates and birds. Light pollution may prevent the selection of the migration route or visits to feeding and breeding sites, which may lead to mass scale destruction of animals or even to the extinction of particular species. Due to the above, light pollution free solutions must be applied in the course of modernisation of public lighting both in suburban areas and in urban areas, which however is not yet a general practice.

2.1.2 Knowledge Base Development

The National Biodiversity Monitoring System (NBMS) was introduced in 1998 to assess the status of and long-term changes in biodiversity in Hungary with selected components at permanent sites, using standard methods. Monitoring takes place at national (central) and territorial (local) level. During the more than 10 years of operation of the system, the number of examined populations and sampling locations has been increased and the methodology has been developed continuously. At present several repetitive data series, suitable for analysing changes, are available for numerous monitored populations.

The data generated in the NBMS are entered into the Nature Conservation Information System (NCIS), which is a technical information system with complex GIS support for biology protection, biodiversity monitoring, geology, nature preservation, nature conservation area and asset management, etc. There is a separate biotic module in the NCIS for receiving and managing biotic data.

“Vadonleső” (“Wild Watch”), a voluntary on-line nature observation programme was introduced in 2009 to collect dissemination data of well recognisable animal and plant species with the involvement of the general public. The data entered into the Vadonleső programme are regularly controlled by nature conservation experts and the controlled data are completed by data originating from monitoring.

With the accession to the European Union, Hungary’s monitoring and reporting obligations increased significantly in relation to the Birds (2009/147/EC) Directive (a re-codified version of the 79/409/EEC Directive) and Habitats Directive (92/43/EEC). On the basis of the new requirements the NBMS has been expanded by a new project (“Monitoring of species and habitats of Community importance (Natura 2000)”), and the sampling methodology was also improved and extended in terms of species/habitats of Community importance. The new project also provides basic data for the reports to prepare every six years on the nature conservation status of species/habitats of Community importance pursuant to the Habitats and Birds Directives. **Sampling protocols are available for more than 80% of species and**

habitat types of Community importance. The results of projects implemented from EU resources made a major contribution to the collection of data, extension of knowledge concerning target species and the improvement of monitoring methods. Among those, the Transition Facility project for the preparation of monitoring in line with the Habitats and Birds Directives, implemented in 2008–2009, and the projects which were awarded grants under Priority 4 of the Swiss-Hungarian Cooperation (environmental initiatives, biodiversity and nature conservation), the implementation of which began in 2012, should be mentioned.

Even with regular data collection, a number of species of Community importance occurring in Hungary still have an unknown nature conservation status in terms of a certain component(s) of the nature conservation status, and there are no nationally representative data for nationally widespread or very rare, not easily assessable habitats and species. The “unknown” category is in many cases due to the lack of information about the life and ecological needs of the respective species, which calls attention to the need for basic research. According to the report prepared in 2013 pursuant to Article 17 of the Habitats Directive the **nature conservation status was “unknown” for 2% of 208 species of Community importance falling within the scope of the Habitats Directive.** In a breakdown by component the category was unknown: for 3 species in the case of the range: for 17 species in terms of the size of population; for 4 species in the cases of species habitat and for 9 species in terms of future prospects. **None of the 46 habitat types of Community importance was classified into the “unknown” category.**

Pursuant to Article 12 of the Birds Directive, the first report dedicated to the nature conservation status of species was prepared in 2013.

The purpose of the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) is to promote adequate use of scientific information and to strengthen the relationship between science and political decision-making. The international platform was established in April 2012 and Hungary joined it in November of the same year. In the first two years of the 25-member strong intersectoral expert body of the platform of our region is represented by two Hungarian experts.

2.1.3 Information on biodiversity, awareness-raising

One of the key issues of preserving biodiversity is whether or not its social acceptance can be achieved. In that regard the objective is that members of society should look at biodiversity as a value and that they should recognise and accept that any decrease in biodiversity will also lead to deterioration in the quality of life that cannot be offset with technological tools. That is why everybody must be made aware of the importance of biodiversity and why extensive attitude building is required. Educational institutions, national park directorates, public collections, botanic gardens and zoos, and nature preservation NGOs have a major role in the performance of that task.

National parks registered **in total 1.4 million visitors in 2012**, which was **10% higher** than in the previous year. Among the registered guests 59% specifically wanted to make a visit to the national park, and the majority of them (51%) came with their families in 2011. On the protected natural and Natura 2000 sites, the nature conservation demonstration sites are the primary scenes of ecotourism and environmental education organised by the national park directorates. Due to the establishment and operation of educational and visitor centres and various demonstration sites, any support to ecotourism also means support to rural job creation. At present the directorates maintain **31 reception, visitor and educational centres**, in addition to which **169 nature trails, 7 country houses arboretums and botanic gardens, 53 other demonstration sites and 42 caves opened to tourism** also assist the interpretation

of natural values. The natural values are presented and the environmental attitude of visitors is shaped within the framework of previously announced programmes, during guided tours and in the framework of forest school programmes and sessions. Since 2007 the Week of the Hungarian National Parks has also been organised across the country, providing an opportunity for attitude building.

Collection gardens, scientific public collections have an important role in the education and attitude building relating to biodiversity as with their organised programmes they pursue active and effective educational and training work and preserve values.

Forest school and forest kindergarten programmes are also important fields in nature and environmental education conducted at educational institutions. In 2012 forestry companies operated 29 and national park directorates operated 15 forest schools (Figure 3), but numerous non-governmental organisations and enterprises also ran several forest schools and provide services according to the local specificities.

	2009	2010	2011	2012
forest schools operated by forestry companies (29)	no data are available	38,376	37,239	39,783
school maintained by national park directorates (15)	10,594	11,792	11,274	10,498
Total (people)	10,594	48,158	46,502	48,269

Figure 3.: Visitors in forest schools operated by forestry companies and national park directorates in a yearly breakdown (persons/year) (Source: OEE and Ministry of Agriculture)

The Ecoschool Network was introduced in Hungary in 2000. Equipped with a quality assurance and quality development system, recognised and controlled by the state, the **ecoschools** are making sure that environmental education is pursued in high quality in all educational areas and that it should develop consistently in their work. **In 2012 in total 711 schools** followed the ecoschool work plan having gained the Ecoschool or Permanent Ecoschool title (when the title has been obtained three times) over the last few years.

Applications may be submitted for the **Green Kindergarten** title since 2006 and in 2012 more than **560 kindergartens** were proud holders of the title. Operation corresponding with criteria that also focus on the protection of biodiversity has an outstanding role in the local pedagogic programmes of such institutions.

The presence of the objectives and tools of biodiversity preservation in the national basic programme of kindergarten education in the National Curriculum, in the framework of curriculum of public education and in the output requirements of the related programmes of higher education (with special regard to teacher programmes) is very important in terms of effective attitude building concerning natural values.

2.1.4 Landscape diversity and ecological landscape potential

Given its landscape structure, in Hungary there are very few natural habitats, isolated natural or semi-natural areas, free of any human intervention, but mosaic type land use and the diversity of habitats and land use methods have been traditionally present. This landscape diversity results in a versatile ecological system and a great deal of biodiversity, although land use conflicts also occur frequently. The ecological network merges with the other structural components of land use.

As a result of the tendencies that developed over the last century and are still present in the current days, landscapes are becoming uniform, the mosaic landscape components are

disappearing in comparison to traditional landscape structure, as an overall consequence of which **the ecological value of areas is decreasing**. The typical developments include the transformation of small parcel vineyards, the simplification of any landscape structure with hamlets, disappearance of the use of gardens from the outskirts of towns, continuous spread of almost 100% paved land use, while the **ratio within the territory of mosaic type landscape components with high ecological value is decreasing**.

These days **15.7% of the territory of the country has been taken out from agricultural cultivation**: during the process, primarily the size of agricultural land and green areas is diminishing. Green surfaces are fragmented and any functional relationship between them is disrupted, plus the consequential harmful effects are becoming stronger. Simultaneously with the reduction of modes of economic operation adapted to the natural characteristics of the landscape not only biodiversity, but also the Hungarian landscape diversity are diminishing.

Landscape classification and status reviews have not been fully implemented in the tool set of landscape diversity preservation to date, and therefore and the completion of that basic research is one of the most important tasks. The identification of processes triggering changes and change monitoring are also important in order to monitor any changes in the statuses of landscape diversity. The unfavourable landscape transformation processes often have a negative impact on the options of biodiversity preservation because the sites of interventions imposing a burden are not designated on sensitivity basis, according to the capacity, and because no landscape valuation tools are applied.

The preservation of micro habitats and green surfaces of local importance, also relevant in terms of biodiversity preservation and registered or worthy of being registered as **individual landscape values** contribute a great deal to the preservation of landscape diversity. Among them, primarily the natural values contribute to the preservation of biodiversity. According to the records of the Ministry of Agriculture, at present **901 settlements have an individual landscape value cadastre** covering the total administrative area of the settlement, which includes the individual cultural history landscape value (77.5%), **the individual natural landscape value (20.5%) and the individual landscape value of the landscape itself (2%)**.

As areas not enjoying enhanced nature conservation protection also have an important role in the preservation of biodiversity, effective and sustainable rehabilitation results may be achieved with landscape scale habitat rehabilitation and landscape rehabilitation interventions. Apart from the protected natural sites, all degraded areas (abandoned mines, illegal waste deposit sites, etc.) are also special targets of landscape rehabilitation, which will be used in the long term as green areas (forests, agricultural and green area), and not as built areas. These days the records of the target areas are inadequate and inconsistent. In such cases, interventions are required to prevent the large-scale occurrence of invasive species on restored areas. Consequently, the landscape restoration and habitat reconstruction objectives vary a great deal, which cannot be implemented without complex records, regulations dedicated to implementation (e.g., spacial planning rules) or the establishment of an adequate financing background.

2.1.5 Green infrastructure development and planning correlations

The green infrastructure concept is a new approach both in European and in Hungary. It goes beyond any traditional approach that focused primarily on protected areas and tries to build and sustain the operability of a system formed from ecological and landscape ecological

relations with a systemic approach in order to preserve biodiversity. Green infrastructure¹⁰ is a partially existing and partially strategically designed network of natural and semi-natural areas, which is capable of providing a wide range of ecosystem services.

According to the existing territorial categories **the backbone of the Hungarian green infrastructure may be the national ecological network** consisting of protected natural areas and Natura 2000 sites **and covering more than 36% of the territory of the country**. Act XXVI of 2003 on the National Spatial Development Plan specifically defines the ecological network among the nationally regulated zones, while its geographic zones (core area, ecological corridor and buffer areas) are defined in the major regional and county spatial planning concepts. In the zones of the national ecological network, the components are maintained, the natural and semi-natural habitats and their relations are preserved by land use rules pertaining to the zones in the course of the territorial planning processes, including e.g., the rules of designation of any area to be built in, positioning of transport infrastructure networks, and the rules of establishment and expansion of mining sites. The zones of the ecological network provide a good basis for developing a Hungarian green infrastructure concept.

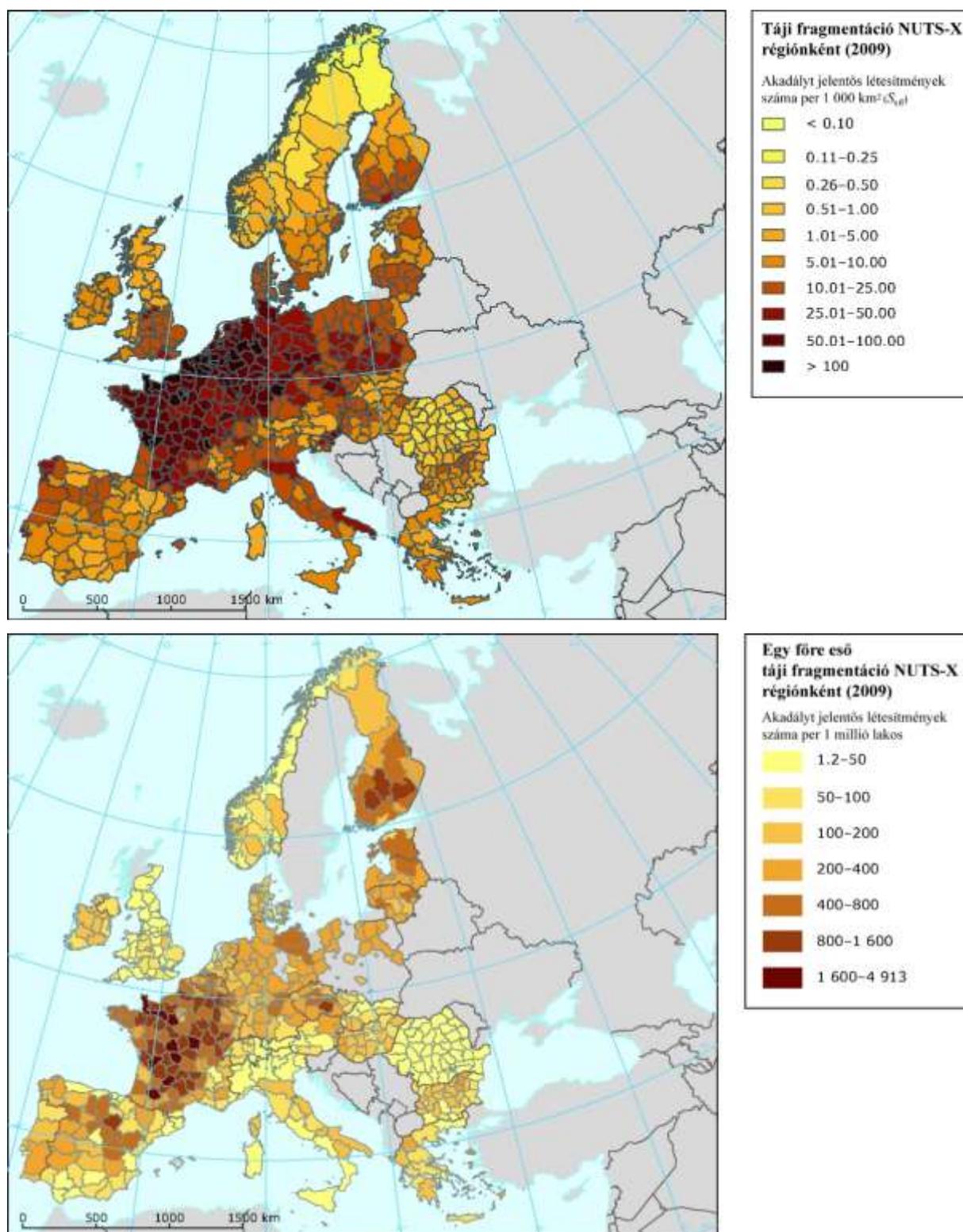
A functionally operating, biologically active green surface system with high ecological value, which is an important factor not only for diversity but also for improving the quality of life of the settlement must be an important part of the green infrastructure network in settlements. The green surface system of a settlement as potential biodiversity areas include not only public parks, public gardens, alleys, water flows, still waters and green surfaces along them, but also residential zones typically structured as suburban buildings or village buildings with a high green surface ratio and other sites (e.g., cemeteries), which demand large green surfaces for their functions. It may be a problem that the composition of species and status of the plants covering such green surfaces occasionally cannot fulfil their adequate ecological functions.

There is no fully complex green data survey or database in Hungary. The green surface index-based survey (GSI) of settlements began over the last few years, which should be extended to the total territory of the country in order to assess the basic situation and establish the green surface area. The required development directions can be defined on the basis of the results of these attempts.

The fragmentation of habitats, which is rather extensive in Europe, is a major problem in terms of preservation and continuation of biodiversity. Research shows that over the last 20 years **the degree of fragmentation of landscapes and habitats continued to increase** and that the negative tendency is likely to continue in the future too.

According to an analysis prepared in 2011 on the basis of a survey of the European Environmental Agency conducted in 2009 in 28 countries of Europe, **Hungary is in a middle position, with 7-10 average fragmentation units** (Map 2). The number of fragmentation units i.e., facilities representing an ecological impediment per 1000 km². As a result of the processing of the analysis by county, there are differences within the country. **In terms of fragmentation the Budapest indicators are the highest (50-100 units) and Central Hungary, North-West Transdanubia and Szabolcs-Szatmár-Bereg county** also stand out with 10-25 units, while in the rest of the country, 5-10 units dominate.

¹⁰ Communication document of the European Commission on green infrastructure (2013)



Map 2.: Landscape fragmentation in the countries of Europe (Source: European Environmental Agency, 2009)

<i>Táji fragmentáció NUTS-X régióként (2009)</i>	<i>Landscape fragmentation by NUTS-X region (2009)</i>
<i>Akadályt jelentős létesítmények száma per 1000 km² (S_{eff})</i>	<i>Number of facilities constituting a hindrance per 1,000 km² (S_{eff})</i>
<i>Egy főre eső táji fragmentáció NUTS-X régióként (2009)</i>	<i>Per capita landscape fragmentation by NUTS-X region (2009)</i>
<i>Akadályt jelentős létesítmények száma per 1 millió lakos</i>	<i>Number of facilities constituting a hindrance per 1 million</i>

	<i>residents</i>
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The habitats are significantly fragmented by the transport infrastructure and built-in areas. The lack of ecological connections between the fragmented and therefore isolated habitats contributes a great deal to the reduction of the survival capacity of natural populations and to an increase in the number of endangered species. Being close to settlements, primarily to large cities causes disturbance and the cessation of potential habitats for most species. The fragmentation impact of transport networks is different on the various habitats and on the species of different spread and moving abilities. While for certain species (e.g., large game, small predators) only busier roads and motorways, separated with a fence, constitute an unbeatable barrier, for other migrating species that move more slowly and less dynamically (e.g., amphibians, reptiles, butterflies) even crossing a minor road could be fatal. Apart from the built-in environment and transport infrastructure, large monoculture agricultural fields without any field margins and/or sheltered belts may also turn into uncrossable cultural deserts. In such areas the significantly reduced biodiversity is practically limited to the edges of the fields, which ultimately also function as limited ecological corridors. In relation to wet habitats, areas on which the potential floods have been excluded, and drained, as well as deteriorated water management areas have reduced and still reduce the habitats.

The medium and high voltage free power lines, crossing the migration and flying routes of birds like a cobweb represent a physical impediment and real risk to them. In 2009 a conflict map of medium voltage power lines and most threatened bird groups was prepared in order to facilitate the scheduling of retrofitting projects and target specific implementation of the Accessible Sky agreement. According to the currently available information of the most risky cables, approximately **900 km of power lines were insulated**, of which approximately **100 km was replaced by underground cables**.

At present the attempts to preserve ecological and landscape ecological relations are limited, primarily to protected natural areas. Although in total 23% of the country is subject to some type of nature conservation, these territories are usually separated from each other and vary in size. However, their direct maintenance and preservation are extremely important but the continuation, preservation, the establishment and development of ecological and landscape ecological relations between them is currently not guaranteed sufficiently.

The space taken by the technical infrastructure and other built-in facilities, often causing irreversible changes, has a fundamental influence on the green infrastructure system described above. It also happens though that the withdrawal of the particular area from cultivation is not followed by any building activity i.e., the re-utilisation of that site as biologically active area could be justified.

The urban development and regulation activities of local government, the decisions on physical planning have long-term effects, either improving, or in the case of bad decisions, even detrimentally and finally influencing the diversity of the ecosystems. Local governments use that tool with variable results. It is a fundamental problem that often development concepts of local governments are not planned properly, and that an evaluation system taking also into account the aspects of biodiversity preservation is not applied during the selection of the sites designated for development. Although the physical planning regulations that entered into force on 1 January 2013 try to ease the above processes, the simplification and acceleration driven modifications of the rules pertaining to the procedures of the authorities continue to reduce the guarantees of preservation and development of green areas.

Instead of the utilisation of abandoned (brownfield) sites, numerous new investment projects are implemented by using production land or a forest (greenfield). Most physical planning activities are limited to the long-term preservation of the particular state or satisfy short-term area utilisation change (investor) requirements instead of serving medium and long-term objectives of interests of the settlement. Among the medium and long-term objectives, the protection of green areas and health environment only rarely occurs as a requirement. The planning methodology applied in the territorial and urban development, as well as physical plans prepared in the recent years show some positive development (e.g., effective land use regulation of the ecological network, extension of the content requirements and stakeholders of local plans, professional control as an actual option prior to the entry into force). However, there is a need for a landscape valuation tool that promotes the biodiversity-based site selection of development projects.

As a result of any support policy that does not sufficiently take into account the criteria of biodiversity, the environmental load will increase dynamically, and the speed of elimination of environmental damages cannot keep up with it. That is why the practical implementation of the principles of prevention and prudence is very important mainly in support policy and in the regulatory environment. Certain environmental certification systems also support the preservation of biodiversity, but their number should be increased.

2.1.6 Ecosystem services

The green infrastructure as a system of areas with ecological functions is closely related to the services provided by the ecosystems. Human existence, especially welfare, as well as social and economic development are based on ecological systems and the goods and services provided by them.

Water (precipitation, surface and sub-surface waters, potable water, etc.) the purity of air, the productivity of land, wood (construction material, fuel, climate improving impact on local larger scale, etc.), food, pollination of plants, the organic material decomposing services, recreation opportunities offered by the nature, etc. all stem from the operation of the ecological systems. A large number of people consider their existence natural and believe that they are all “free” without even thinking that the goods and services used in everyday life are in fact the “products” of a very vulnerable system, the maintenance of which is the responsibility of its users. Ecosystems are systems in which the continuation of each component depends, either directly or indirectly, on numerous other elements. The reduction of biodiversity makes ecosystems more and more vulnerable and therefore their resistance against external effects is also decreasing.

The expansion of built-in areas, environmental pollution, large-scale agriculture, climatic change, etc. are harmful to the operability of the ecological systems, as well as to the existence, quality and quantity of the goods and services provided by them.

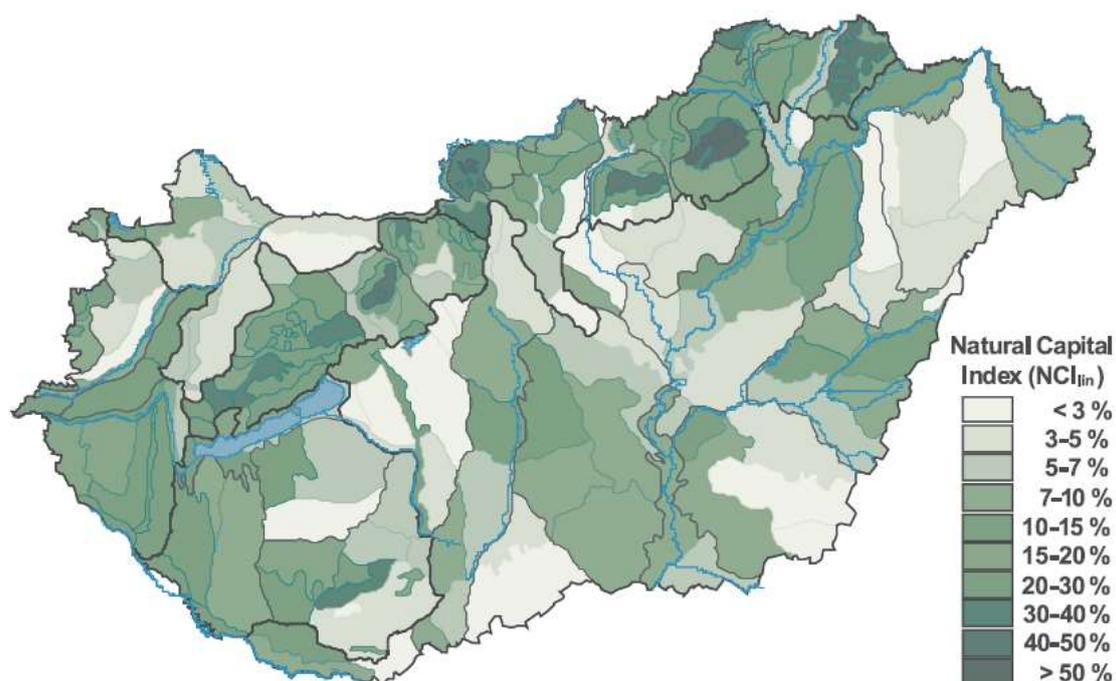
The increasing deterioration of the ecosystem services and the need for their assessment have already been pointed out in the Millennium Ecosystem Assessment¹¹. To date there has not been any **method accepted for the assessment of the services and widely available also in Hungary**, but some methodology foundations already exist with specific limitations and potential errors. International research estimated the global value of ecosystem services at average USD 33 billion¹². According to former model reviews, the global total value of

¹¹ Millennium Ecosystem Assessment, 2005

¹² Costanza et al. (1997): The value of the world's ecosystem services and natural capital – Nature 387., pp. 253–260.

ecosystems equals 44–88% of the global GDP¹³. The elaboration and implementation of a detailed assessment methodology to be applied in a wide range of ecosystem services, also including preparations for environmental policy decisions is a task for the future.

The research activities for the more specific assessment of ecosystem services in Hungary have focused mostly on specific segments of individual scientific disciplines. On the basis of Hungary's Habitat Map Database (MÉTA), the country's Natural Capital Index¹⁴ (NCI) was also calculated, expressing the distance between the complex landscape and the one-time natural status. According to a general purpose straight weighted calculation-based land assessment of the analysis completed in 2008, **Hungary's Natural Capital Index is 9.9%**, which means that **more than 90% of the ecosystem services of the natural habitats that existed on the territory of our country in the past have already disappeared**. On the map below (Map 3), the higher values refer to the habitats that have remained in a more natural condition.



Map 3.: Hungary's plant-based Natural Capital Index (NCI_{lin}) by geographic small region (Source: Research based on the MÉTA database, 2008)

2.1.7 Genetic resources constituting the biological basis of our agriculture

Genetic resources of plants used for food and agricultural purposes

Of the local and regional varieties used by farmers for a long time **75% has been lost globally** over the last one hundred years¹⁵, as they were taken out from production to be replaced by varieties used by intensive agriculture. Within the total food supply of the world 75% stem from only 12 plant species and 60% of our food originate from 3 plant species (rice, wheat and corn). The same tendency also applies in Hungary, because as a result of the transformation of the economy, society and agriculture, the diversity of plant genetic

¹³ Alexander et al. (1998): A method for valuing global ecosystem services – Ecological Economics, 2.,161–170.

¹⁴ Czúcz et al. (2008): The Natural Capital Index of Hungary – Acta Botanica Hungarica 50., pp. 161-177.

¹⁵ Food and Agriculture Organization of the United Nations (FAO), 1999

resources have been decreasing over the last few decades. The increase in the urban population also led to a decrease in the rural population; the disappearance of domestic farms and domestic gardens is a serious problem in terms of food safety and preservation of the genetic resources used in agriculture.

The *ex situ* preservation of genetic resources is developing year by year across the world, also including Europe and Hungary, whereby gene banks keep more and more genetic material. However, the degree of collection and preservation is still not higher than the rate at which species disappear (become extinct). The *ex situ* preservation is the basis of on farm preservation. The collection of gene sources, their preservation in gene banks and then return to farmers, small farms and domestic farms is the only definite solution for the long-term preservation and sustainable utilisation of plant genetic resources. In Europe, gene banks currently keep approximately 1.7 million items, of which approximately **150,000 are kept in gene banks and gene preservation organisations in Hungary**, which is an outstandingly high figure compared to the territory of the country.

The **Plant Diversity Centre (NöDiK)** is Hungary's largest plant gene bank, which has been coordinating the gene preservation activities of the country since 2010. With the preservation of approximately **94,000 samples involving 48,000 unique items** (Figure 4) NöDiK has a rather significant collection both in European and internationally. The majority of them have been collected in Tápíószele through gene bank seed exchanges since the 1950s (Figure 5). A large number of items have also been collected within the Carpathian Basin, but the shortage of funds and lack of capacity has been a major impediment in the organisation of collection trips over the last few decades. It is especially important to begin collecting old varieties and regional varieties which still exist in the shrinking small gardens, domestic gardens and domestic farms. Emphasis should be put primarily on areas where no collection has taken place yet, or only very few items have been collected.

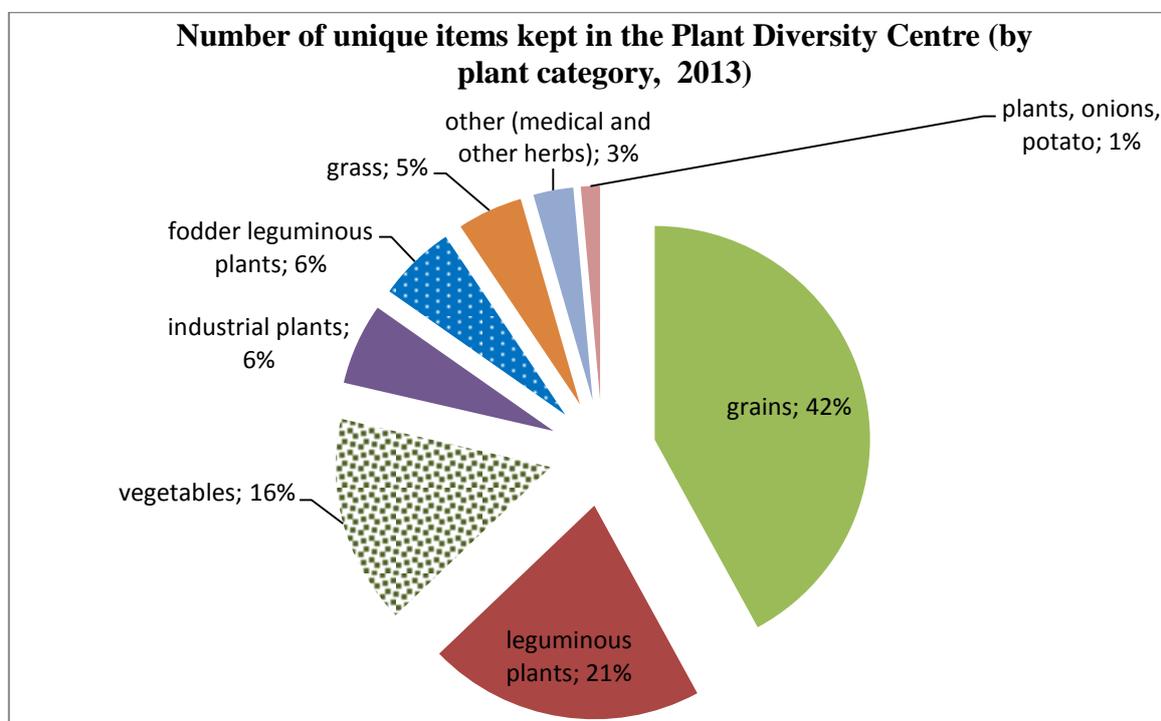


Figure 4.: Number of unique (individual) items kept at the Plant Diversity Centre. (Source: NöDiK, 2013)

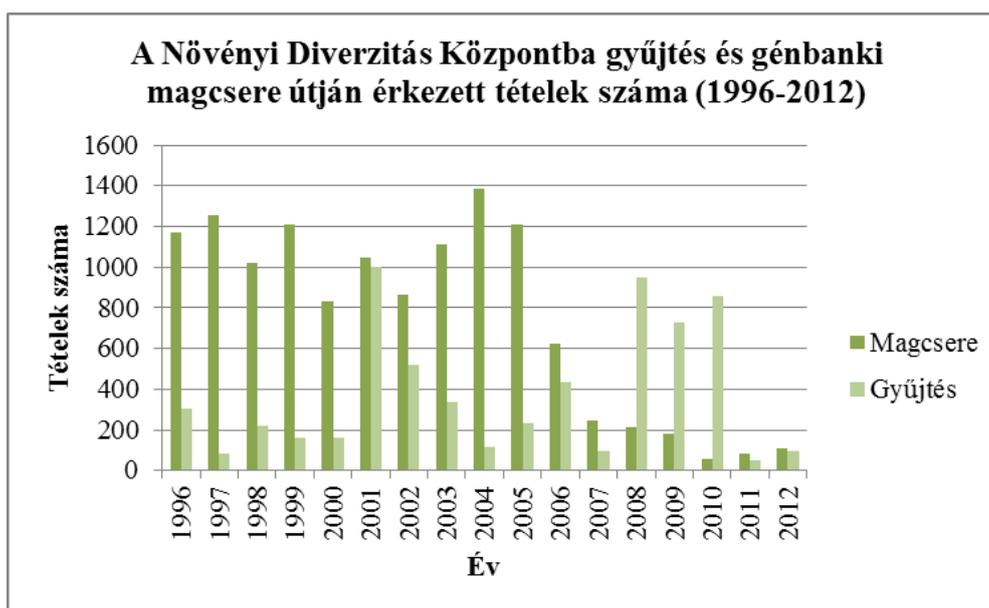


Figure 5.: Number of items collected at the Plant Diversity Centre through collection and gene bank seed exchanges. (Source: NöDiK, 2013)

<i>A Növényi Diverzitás Központba gyűjtés és génbanki magcsere útján érkezett tételek száma (1996-2012)</i>	<i>Number of items received at the Plant Diversity Centre through collection and gene bank seed exchange (1996-2012)</i>
<i>Tételek száma</i>	<i>Number of items</i>
<i>Magcsere</i>	<i>Seed exchange</i>
<i>Gyűjtés</i>	<i>Collection</i>
<i>Év</i>	<i>Year</i>

Interest in old varieties, regional landraces and historic varieties kept in gene banks has been increasing over the last few years. However, due to the shortage of funding and lack of capacity, the gene banks can satisfy only very few requests. However, in order to safely preserve genetic materials, it is absolutely necessary to make the items kept in gene banks accessible by farmers, thus ensuring its survival through production.

Preserving the varieties and landraces grown in the Carpathian Basin for a long time is an especially important national task. In order to facilitate safe preservation the laws and regulations allow **simplified registration of landraces**, which is indispensable for their appearance on the market besides the global varieties and return into small gardens and small farms. The **National Food Chain Safety Office (NéBiH)** has received **approximately 80 notifications** so far, of which **by the end of 2013 in total 19 fruit landraces** were added to the list of national varieties.

Forest genetic resources

In forestry gene preservation *in situ* preservation refers to indigenous tree species forming forests of natural origin. *Ex situ* preservation is applied primarily to endangered, very rare species, which would be difficult to preserve under natural circumstances.

The *in situ* forestry gene reserves were selected between 2001 and 2004 on which three gene reserves were registered the official register of NéBiH in 2012. Of the candidates populations listed over of the previous ten years, only 95 populations remained, the registration of which is an urgent task. The decrease is due to the end use of the forest populations and their renewal with propagation material that does not contain the local gene set. The majority of the

Hungarian forestry gene bank items consists of non-indigenous species; approximately 9,000 ex situ items of 35 tree species are kept in the gene bank.

Farm animal genetic resources

These days there are 30 farm animal species of agricultural significance, while 90% of the total animal products of the world originate from the breeding and keeping of only 14 species. Over the centuries, the breeders and animal farmers created numerous breeds, as a result of which the number of agricultural animal breeds in the world is between 4,500 and 5,000. As animal farming became more intensive, only 9 species provide the majority of the individuals of the breeds referred to above.

The projected indigenous animal breeds which represent considerable genetic values and have been bred over a long time in history in Hungary's natural geographic environment, as well as the endangered agricultural animal breeds pushed out from production simultaneously with the dissemination of intensive breeds are of major importance. At present in Hungary **35 protected indigenous and 1 endangered agricultural animal breeds** are registered. The preservation of those breeds in their original condition is a national interest and a public task.

Owing to the target specific and professional breeding work and gene preservation activities, as well as the support provided from the European Agricultural Fund for Rural Development for the preservation of protected indigenous and endangered agricultural animal breeds within the framework of the preservation of the genetic stock of protected indigenous and endangered agricultural animal breeds in breeding and preservation of genetic resources measure, in recent years the **populations of our protected indigenous and endangered agricultural animal breeds have been increasing smoothly and gradually**. However, the population must continue to grow in order to ensure that the breeds survive.

2.1.8 Agriculture

The majority of Hungary's territory has favourable agro-ecological conditions, but land use and the intensity of cultivation do not always reflect the features and environmental sensitivity. The excessive use of natural resources, the appearance and spread of invasive species, unprofessional agro technology disregarding environmental criteria and the impacts of climate change and the lack of environmentally aware farming is a problem in numerous places. The intensive farming and the abandonment of cultivation may also impose a threat, reducing biodiversity. In relation to those, farming risks, environmental and agricultural damages occur continuously. Consequently, guidance to small and medium-sized enterprises and application of more environmentally friendly technologies used by them are objectives that should be supported.

Of the 9.3 million hectare territory of the country 57.4% is agricultural land (46.5% is arable land, 8.2% is grassland and 2.7% are gardens, vineyards and orchards), while 20.7% is covered by forests¹⁶.

Soil condition and replenishment of nutrients

Soil is a very important and conditionally renewed natural resource of our country, the protection and continued productivity of which is a long-term interest of not only the land users, but also of the whole society. At the same time, society has very little knowledge about the types, function and role of soil, or the consequences of the decay of soil. The overall condition of soils is favourable, but the productive soil involved in agriculture are at risk by

¹⁶ Central Statistical Office (CSO) (2011)

degradation processes (e.g., erosion, deflation, reduction of organic material stock) impeding them in their functions and reducing their productivity. Soil degradation processes often develop due to inadequate land use and farming that disregards soil protection criteria and, apart from some reduction in soil productivity, it leads to higher costs of agricultural production, the disruption of ecological and water balance circular processes, accumulation of risky materials and contamination of water basis. Integrated nutrient management has an important role in sustainable soil utilisation. As a result of the spread of infrastructure, industry and settlements, arable land is withdrawn from cultivation on a large scale and a lot of land is covered permanently. Soil is the basis of food production and, apart from other environmental services, it also has a role in mitigating and adapting to the impacts of climate change, as well as the preservation of biodiversity.

The nutrient balance of the soil reveals changes in the nutrient status of the soil and the turnover of the main minerals important for plants. If the balance of a particular nutrient is durably and significantly positive, then there is a high risk of nutrient-washout and water contamination, which will also have a detrimental impact on the ecosystem. Between 2000 and 2011 the **volume of nutrients entered into the soil in Hungary was more or less constant.**

Pesticides and artificial fertilisers

The use of pesticides, especially unlawful use and utilisation contrary to the licence document is a major risk both in terms of the environment and health, plus the certain pesticides in circulation, decomposed very slowly and therefore may have an impact for years and decades. The consequential health and environmental risk may be reduced by using the principles of integrated plant protection. However, it cannot be achieved without a deliberately assumed role of the state. In addition, the elaboration of a strategy for the mitigation of the pesticide utilisation risk is one of the main areas of the EU environmental action programme as well. Following extensive social consultations, at the end of 2012 Hungary approved the National Plant Protection Action Plan, which defines the strategic goals of the sustainable use of pesticides. Apart from an environmentally harmful effect of pesticides, inadequate use of artificial fertilisers may lead to the accumulation of heavy metals in the soil, and their integration into the food chain, plus the acidification of soil and, indirectly, the contamination of underground waters may also cause environmental problems.

Agri-environmental programme

The agro-environmental measures (AEM) supported from the European Agricultural Fund for Rural Development Fund (EARDF) between 2009 and 2014 set a goal of establishing a production structure that reflects the specificities of the place of production, environmental farming and sustainable land use, improvement of the status of environment and a sustainable agricultural practice.

Over the last few years in Hungary **the ratio of territories involved in the agro-environmental management programme has been around 20% of the total agricultural area.** Since the Common Agricultural Policy (CAP) reform in 1999 the agro-environmental management measure has been a mandatory component of the rural development programmes of the Member States and the integration of environmental aspects into CAP is mentioned together with cross compliance. The main objective of the measure include soil protection, nature protection, promotion of food safety, support to animal farming and landscape management, as well as change in land usage. The agro-environmental management measure launched in 2009 contains higher level target programmes than in the period between 2004 and 2009, focusing primarily on programmes further developed towards quality on a proportionately smaller territory.

In 2010 the **size of the territory belonging to the agro-environment management programme was 1,163,000 hectares**, of which the land use dedicated to the preservation of agricultural biodiversity was 560,000 hectares.¹⁷

According to the data of the Research Institute of Agricultural Economics, **in 2012 Hungarian farmers received HUF 649.98 billion agricultural-rural development support. Almost 14.3% of that (HUF 92.65 billion) related to the EARDF environmental measures**, which directly or indirectly contribute to the preservation and continuation of biodiversity. Within that the agri-environmental management payments were the largest amount (EUR 228,916,305) (Table 1).

EARDF environmental measures	2012 payment (EUR)
Agri-environmental management payments	228,916,305
Support to the afforestation of agricultural areas	16,588,550
Less favoured areas	9,588,754
NATURA 2000 forest sites	0
NATURA 2000 grassland	7,845,257
Preservation of the genetic stock of indigenous agricultural animal species in breeding	3,119,435
EARDF forest structure transformation	640,377
Non-productive agricultural investments	1,662,618
Forest-environment protection	1,105,527
Support to agri-forestry systems	145,661
Support to the restoration of forest potential	622,092

Table 1.: Payments related to EARDF environmental measures in 2012 (source of data: NHRDP annual report)

Between 2009 and 2013 the currently running programme was dominated by measures with small nature conservation results. A task and challenge of the new planning period is to continue increasing the ratio of funds dedicated to any activity that makes an effective contribution to nature conservation objectives. These ratios should definitely be improved in the next 2015–2020 programming period in order to preserve biodiversity.

Between 2000 and 2004 the size of **the territory involved into ecological farming** in Hungary grew by almost 140%. Following the launch of the National Rural Development Plan agri-environmental management programme (NRDP AEP) in 2004 the variation in the size of territory followed the schedule of the support programmes. Prior to the launch of NRDP AEP in 2004 and the New Hungary Rural Development Programme, agri-environmental management programme in 2009 the size of the territory involved in ecological farming increased rapidly in the hope for support but, as the programmes progressed, some areas dropped out continuously due to exclusion from support and withdrawals. Between the five-year phases no new parties could join the programme, therefore the motivating effect of the support could not be felt in the increase of the territory. In 2011 the **ratio of ecological farming within the total agricultural territory was only 2.3% i.e., 124,000 hectares** (Figure 6). The Minister responsible for Nature Conservation approved Hungary's Organic Farming Action Plan at the beginning of 2014. The objective of the Action Plan is to improve the conditions of the sector and to be at the top of the EU in terms of organic farming.

¹⁷ National Rural Strategy 2012-2020

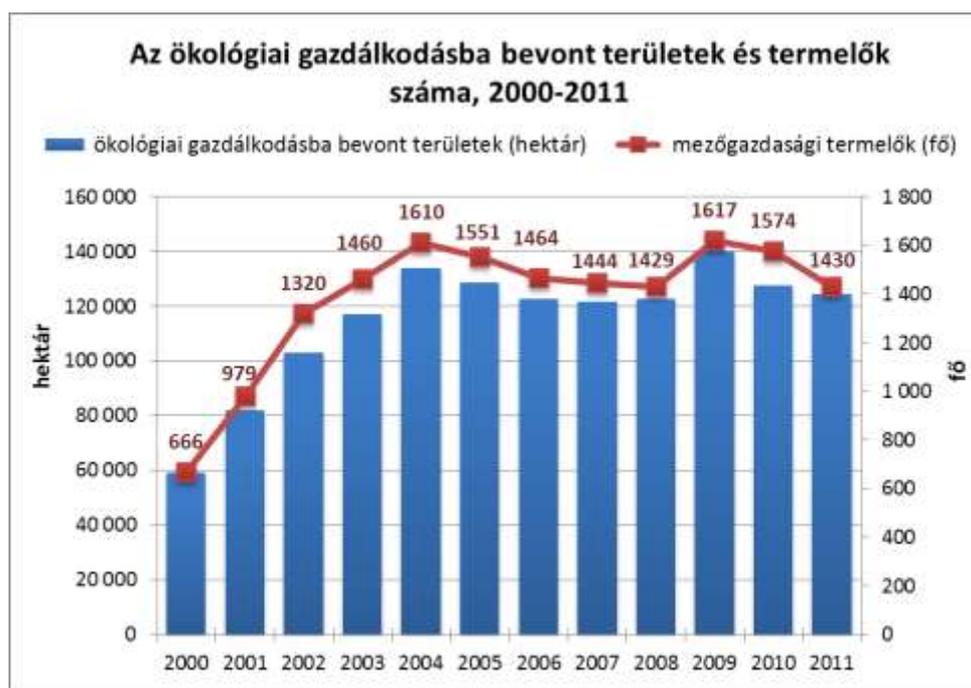


Figure 6.: Number of territories and producers involved in organic farming, 2000-2011 (Source of data: HCSO, 2013)

<i>Az ökológiai gazdálkodásba bevont területek és termelők száma, 2000-2011</i>	<i>Areas and number of producers involved in organic farming, 2000-2011</i>
<i>ökológiai gazdálkodásba bevont területek (hektár)</i>	<i>areas involved in organic farming (hectare)</i>
<i>mezőgazdasági termelők (fő)</i>	<i>agricultural producers (person)</i>
<i>hektár</i>	<i>hectare</i>
<i>fő</i>	<i>person</i>

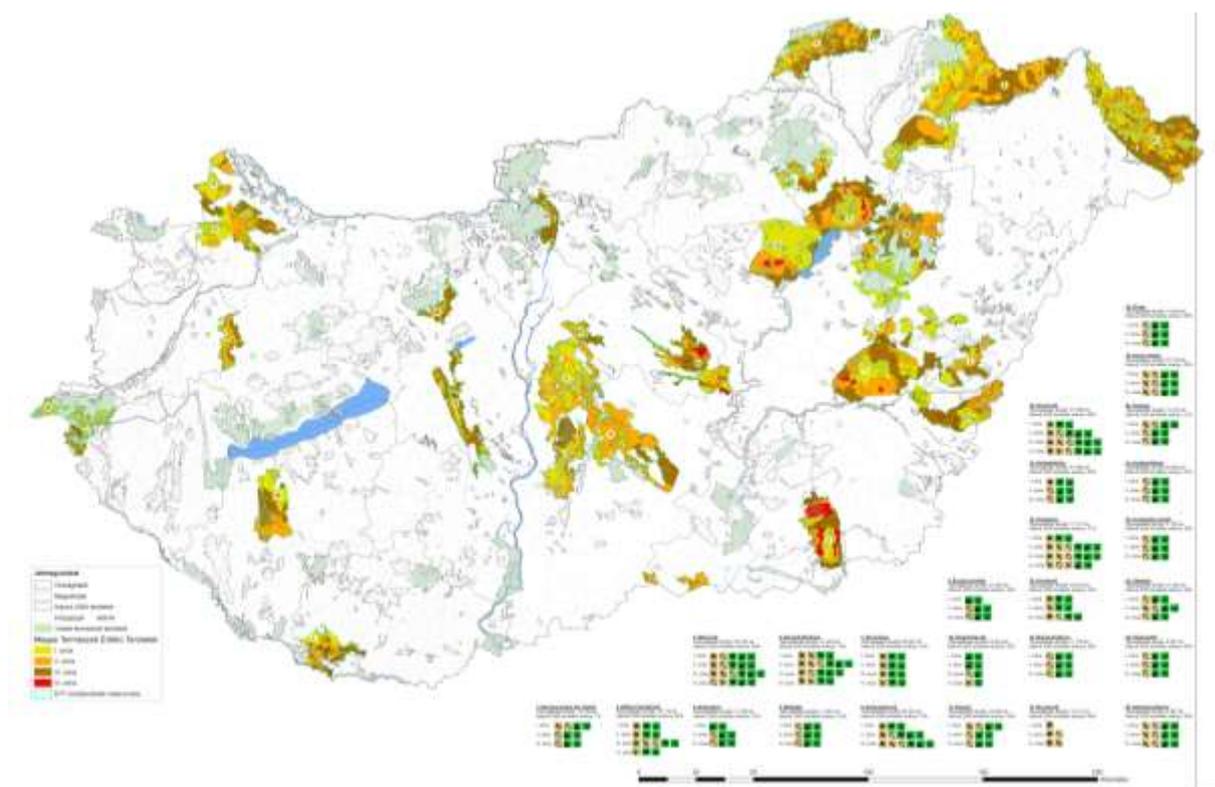
A considerable number of the natural assets of Hungary relate directly to areas subject to agricultural cultivation and landscape management has a major role in their maintenance. The maintenance of our protected natural sites and the favourable natural condition of the Natura 2000 sites does not only and exclusively entail reserve type protection, but often also includes a need for utilisation and management for nature conservation purposes.

Depending on the needs of a particular natural asset, the nature conservation objectives and tools relating to the transformation of land use may also vary from joining voluntary support system through binding land use regulations to asset management by national park directorates of the state-owned nature conservation sites.

Within the agri-environmental management measures (AEM), the high nature value area programme group has an important role in terms of biodiversity by focusing on the protection of the main (umbrella) species on specifically defined areas and also includes complex habitat development target programmes. The **Great Bustard population of 1,500 birds¹⁸, an umbrella species** of international importance in Hungary, represents a special value with a slightly growing number over the last decade, but the protection of the population demands extensive management of large grasslands and mosaic type croplands.

The High Nature Value Areas (Map 4) are areas subject to extensive cultivation that support the preservation and maintenance of nature friendly farming, the protection of habitats, the continuation of biodiversity and protection of landscape and cultural history values.

¹⁸ Hungarian Bustard Protection Team synchronous count data



Map 4.: High Natural Value Area system (Source: Ministry of Agriculture, 2009)

<i>Jelmagyarázat</i>	<i>Symbols</i>
<i>Országhatár</i>	<i>Country border</i>
<i>Megyehatár</i>	<i>County border</i>
<i>Natura 2000 területek</i>	<i>Natura 2000 sites</i>
<i>Közigazgatási határok</i>	<i>Administrative borders</i>
<i>Védett természeti területek</i>	<i>Protected natural areas</i>
<i>Magas Természeti Értékű Területek</i>	<i>High Natural Value Areas</i>
<i>I. zóna</i>	<i>Zone I.</i>
<i>II. zóna</i>	<i>Zone II.</i>
<i>III. zóna</i>	<i>Zone III.</i>
<i>IV. zóna</i>	<i>Zone IV.</i>
<i>ETT mintaterületek határvonala</i>	<i>ETT sample area borderlines</i>
<i>Támogatható terület</i>	<i>Areas eligible for support</i>

Between 2009 and 2013 the zonal payments of the New Hungary Rural Development Plan Agri-Environmental Management are available on 25 sample areas. **The total territory of the designated HNVA is 1.2 million hectares, of which 900,000 hectares are eligible for support within the framework of AEM.** In 2011 farmers supported in the programme requested payments for **more than 94,000 hectares of arable land and more than 100,000 hectares of grassland** in 2,700 support request within the framework of the zonal target scheme available on HNVA (Table 2).

AEP target programme	area hectare	application number
AA) Integrated arable land plant growing target programme	555,261.79	2,578
AB) Hamlet operation target programme	1,592.57	141
AC) Ecological arable land plant growing target programme	41,208.14	517
AD1) Arable land plant growing, with bustard habitat development requirements target programme	59,205.24	885

AD2) Arable land plant growing, with wild goose and crane protection requirements target programme	287.73	7
AD3) Arable land plant growing, with bird and small game habitat development requirements target programme	32,348.82	763
AD4) Arable land plant growing, with red-footed falcon habitat development requirements target programme	2,171.53	53
AE1) Anti-water erosion target programme	2,461.26	50
AE2) Anti-wind erosion target programme	6,363.05	342
BA) Extensive grass farming target programme	161,779.04	3,051
BB) Organic grass farming target programme	28,380.52	244
BC1) Grass farming, with bustard habitat development requirements target programme	75,271.56	699
BC2) Grass farming, with habitat development requirements target programme	25,077.36	381
BD1) Lawn growing for environmental purposes target programme	3,429.39	110
BD2) Nature conservation aimed lawn laying target programme	3,439.23	117
CA) Integrated fruit and grape growing target programme	60,418.09	5,884
CB) Organic fruit and grape growing target programme	4,432.16	410
CC) Traditional fruit-growing target programme	1,164.10	112
DA) Reed farming target programme	7,236.52	102
DB) Natural wetland habitats, bogs, reeds and sedge area management target programme	24.00	2
DC) Establishment and management of wetland habitats target programme	6.68	1

Table 2.: Areas affected by the AEM target programme (Source: 2011 progress report on the implementation of the NHRDP)

Grassland management and livestock production with grazing

In Hungary grassland management and grazing-based livestock production had a major role in agricultural production until the first half of the 20th century. However, the **territory of Hungary belonging to grassland management shrank** from 1.2 million hectares prior to the systemic change (12.9%) **to only 8.2% of the territory of the country by now**. In an international outlook, this almost uniquely low share is significantly lower than the land usage which, in proportion, is lower than half of the EU average. The utilisation of grassland has also reduced and productivity expectations have changed. These days, the preservation of grassland in its natural state is mostly at risk by inadequate utilisation and inadequate grazing. The land use distorting effects of the support system and the gradual decrease in the grazing stock often led to the ploughing of grassland and the change of the cultivation. Among the livestock farming, branches among the small ruminating group, the cattle branch is the one that has been and may also be dominant in the Hungarian grassland-based livestock farming.

The utilisation of grassland with mowing and grazing is indispensable to protect the related natural values, which simultaneously also increases the number of people living from that sector because livestock production generates a lot of jobs. However, the utilisation method, the selection of the grazed species and the grazing density, as well as the time schedule of the farming operations determine the success as to whether or not the biodiversity of the particular area can be preserved. The key to preservation is support to small and medium-sized enterprises in this field too, because the industrial large-scale systems do not facilitate the implementation of the objectives of this strategy.

Despite the above problems, it indicates the outstanding natural value preservation role of these areas that in Hungary the share of grassland within the Natura 2000 network is more than twice the EU average, which especially draws attention to the adoption of the measures required for the protection of the related species and for the more extensive utilisation of the available resources.

In the case of grassland the compensation payment for farming within Natura 2000 grassland sites have been available since the 2007-2008 economic year, under the title of EARDF Environmental Measures since 2009, to recognise compliance with the land usage rules. The measure promotes the preservation of the natural preservation status of indicator species listed in the respective EU regulations and of the designated habitats by maintaining environmentally friendly land usage methods. According to the feedbacks from farmers to date, the **compensation payment** has been popular. In 2011 in total 7,214 support applications were received (Table 3), while in 2012 **the size of the supported areas exceeded 250,000 hectares.**

	2011		2007-2011	
	number	EUR	number	EUR
Received support applications	7,214	8,943,422	21,258	23,241,202
Of which rejected	1	226	510	352,183
Withdrawn	0		3	
Approved	7,138	9,039,429	20,597	22,620,183
Supported payment application	0	0	0	0
Payment (from the commitment of the Programme)		8,076,360		14,843,656
Within the payment - Community		6,188,727		11,432,501
Within the payment - convergence region		7,117,647		13,252,880
Of which Community		5,663,953		10,558,992

Table 3.: Results in 2011 of the compensation support title available for farming on Natura 2000 grassland sites (Source: 2011 progress report on the implementation of the NHRDP)

2.1.9 Forest management

In Hungary 2,051,000 hectares are used for forest management, which equals **20.7 %** forests within the total territory of the country. This was achieved in 70 years from 11% forest ratio within the total territory of the country. In a European comparison, Hungary belongs to the countries with low forest ratio, therefore a further increase in the size of forests in the country is one of the objectives of forest management. According to the government's intentions, afforestation will continue to be an important component for land utilisation: the National Afforestation Programme set a goal of 25–26% forest ratio by 2050, but because of the major decline in the speed of afforestation, the growth is expected to be more moderate in the subsequent period. This role may be taken over by tree plantations.

Apart from the territory of forests the **live tree stock (362 million cubic metres) is also growing** continuously (Figure 7). Owing to an increase in the live tree stock, our forests contribute to slowing down the climate change process by binding the carbon in the wood on a permanent basis. Over the last ten years on average 3 million tonnes of carbon dioxide was bound from the atmosphere, which compensates for approximately 5% of the Hungarian emission.

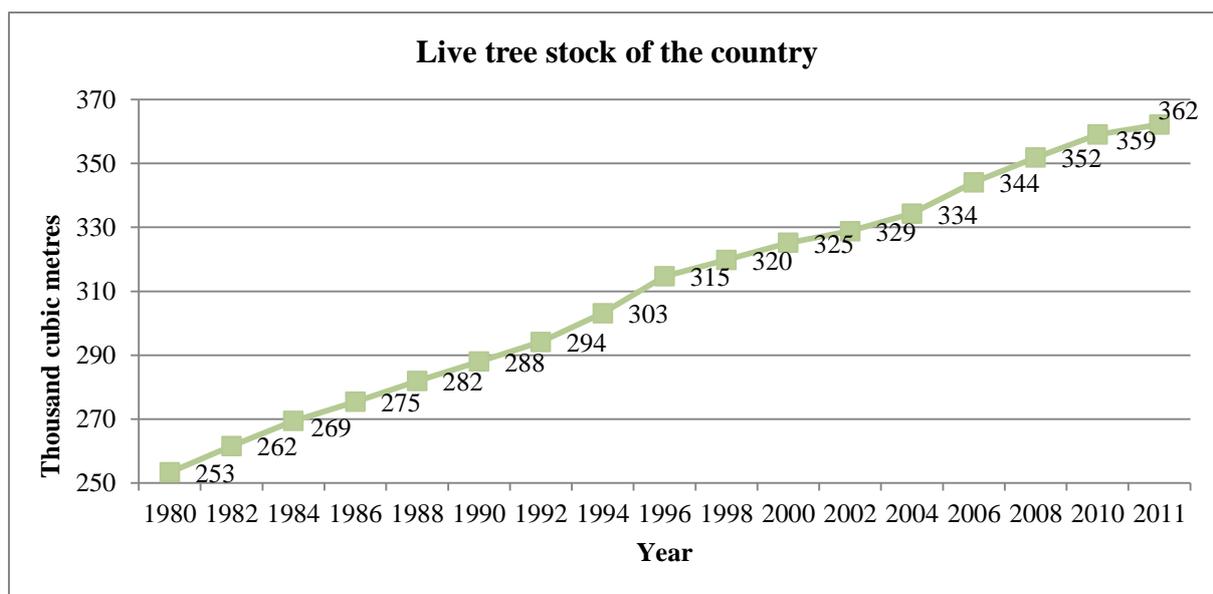


Figure 7.: Live tree stock of the country over the last three decades in one thousand cubic metres (Source of data: NFCSO Forestry Directorate)

The six categories of the naturality of Hungarian forests are defined in the Forestry Act. According to the classification, **53% of the forests belong to the first three categories, more favourable in terms of biodiversity preservation (natural forest, semi-natural forest and derivative forest)**. The remaining **47%** consists of forests **comprising mainly non-indigenous species** and created during the afforestation process (Figure 8). The planted forests have a positive impact in terms of biodiversity, but sometimes forests were planted last century to replace valuable meadow formations. Primarily owing to afforestation, the territory indigenous species has increased by more than 1,200 hectares each year over the last ten years.

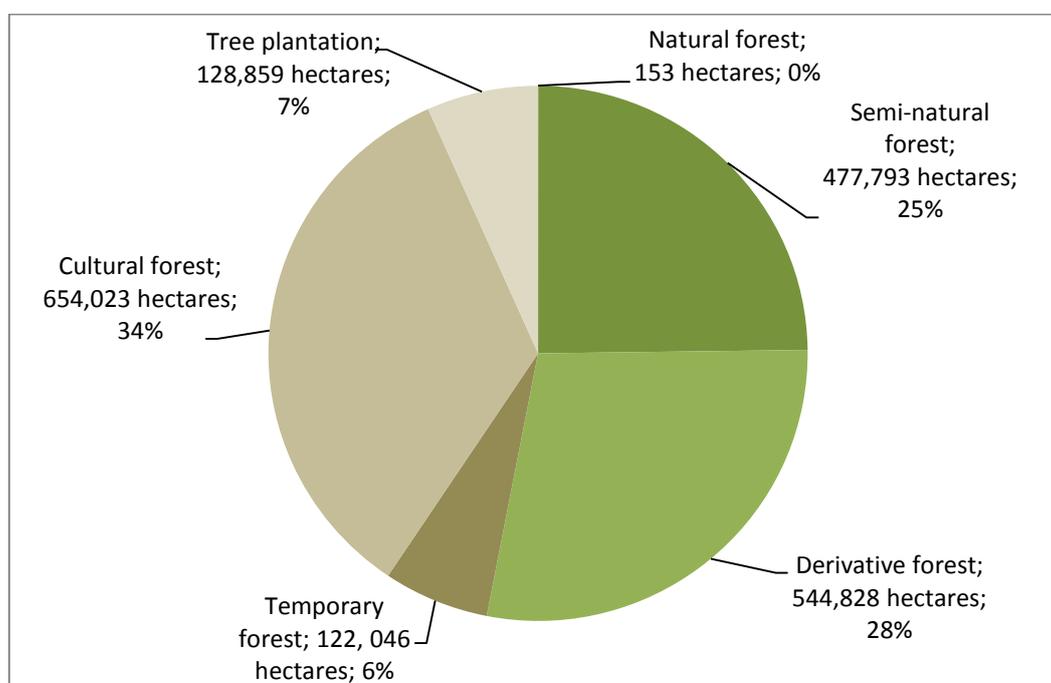


Figure 8.: Breakdown of the forest territory by the status of naturality (Source of data: NFCSO Forestry Directorate, 2011)

Forest reconstruction is an obligation of the forest manager defined by law. The dissemination of natural reconstruction, favourable for biodiversity is a clear tendency in the indigenous tree species, involving the reduction of artificial forest reconstruction for populations where the natural forest reconstruction is not feasible at all, or only with disproportionate large risk and additional expenditure. During the reconstruction of forests consisting of mainly indigenous tree species corresponding with the particular habitat are given preference. Thanks to legal regulation, knowledge dissemination, specialised workshops and a voluntary change in forest holders' attitudes, **the area continuously covered by forests is growing**; its total size was **102,000 hectares** in 2011. (Figure 9.)

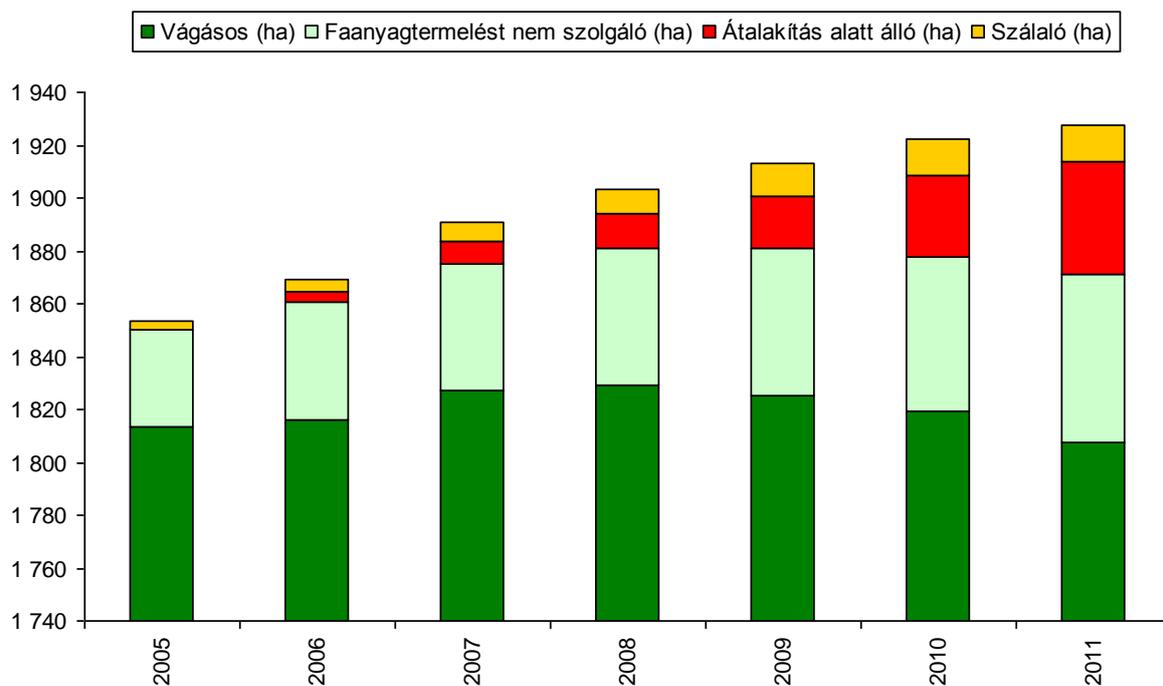


Figure 9.: Breakdown of the forest territory of the country by mode of operation in thousand hectares (only forest segments) (Source: NFCSO Forestry Directorate)

<i>Vágásos (ha)</i>	<i>Cutting (hectare)</i>
<i>Faanyagtermelést nem szolgáló (ha)</i>	<i>Not used for timber production (hectare)</i>
<i>Átalakítás alatt álló (ha)</i>	<i>Subject to transformation (hectare)</i>
<i>Szálaló (ha)</i>	<i>Selection (hectare)</i>

According to a survey conducted in 2011, the amount of deadwood enriching forest habitats is **17 million cubic metres**, almost two and a half times more than the annual amount logged for production. More than half of that is comprised by trees that are still standing.

The **health conditions** of our forests is established on the basis of a single European survey method and **is considered good** even in European comparison. There is significant annual fluctuation in abiotic (e.g., wind, frost, drought, fire) and biotic (e.g., leaf chewing, beetle damages, fungus infection, tree decay), the prevention of which is stressed mainly in silviculture. Active protection against rodents and insects is applied only in extremely justified cases, by using environmentally friendly technologies. The **game damage** affecting almost all forests of the country which is often difficult to detect is another issue, because it is one of the major impediments to any further dissemination of semi-natural silviculture.

The spacial distribution of forests is favourable despite the low forest ratio. **Nearly 60% of our forests are in blocks, larger than 1,000 hectares**, which form consistent forests or a

large size for the protection of individual forest habitats. However, the nature conservation value of small scattered patchy forests inserted between agricultural fields and often covering less productive areas with gullies cannot be underestimated either. The new forests established through afforestation with indigenous species typically appear as small forest patches or in relation to medium-sized and small forests, enriching the habitats of the particular area.

The size and ratio of the **forests primarily serving nature conservation purposes** within the total forest territory is an important indicator of preservation of biodiversity. The Hungarian situation is favourable in a European comparison too, because approximately 25 percent of the forests are primarily intended to be used for nature conservation, which means that approximately 453,000 hectare forests are subject to nature conservation protection. The elaboration and application of nature conservation management plans is of key important in relation to such forests. There are almost 13,000 hectares, in total 63 forest reserves on the territory of forests subject to nature conservation, on the core territory of which no intervention can be made for management purposes. The designated Natura 2000 forest territory is in total 833,000 hectares, which contains two-thirds of the territory covered by indigenous tree species. The territory and ratio of forests intended for protection and, specifically nature conservation purposes has increased significantly over the last 20 years (Figure 10).

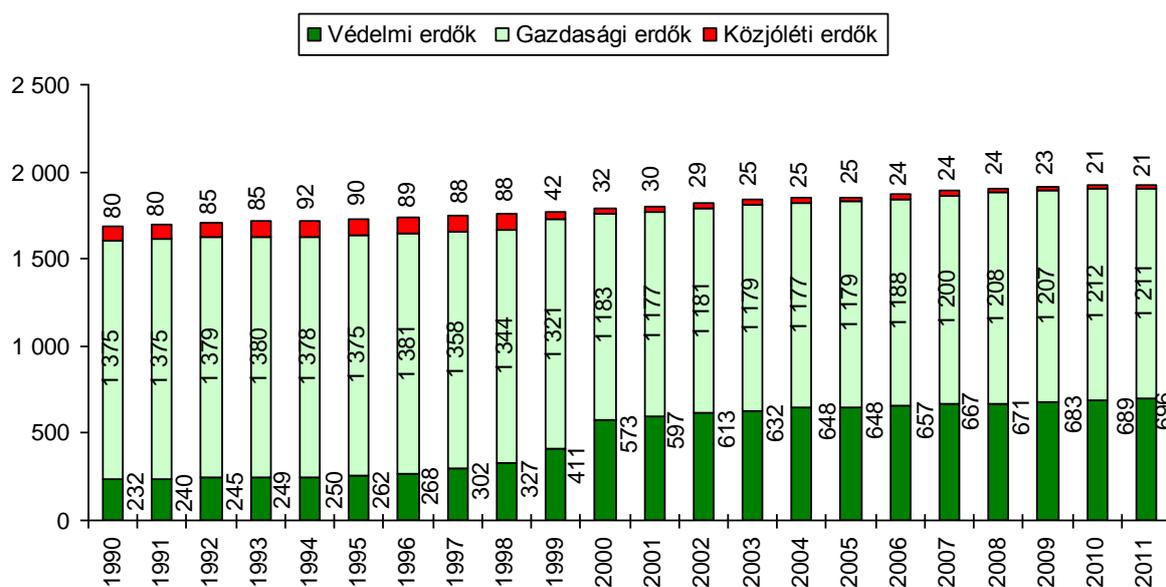


Figure 10.: Variation in the forest territory of the country covered by trees according to purpose groups and primary designation (thousand hectares) (Source: NFCSO Forestry Directorate)

<i>Védelmi erdők</i>	<i>Protective forests</i>
<i>Gazdasági erdők</i>	<i>Economic forests</i>
<i>Közjóléti erdők</i>	<i>Public welfare forests</i>

The Natura 2000 appropriate assessment procedure has been integrated into the forest planning process as an EU obligation. In addition, the natural process-based forest management and a change in the attitude of forest managers are also assisted by economic incentives. Owing to the afforestation efforts, the territory of indigenous tree populations is continuously increasing. In 2012 compensation payments from rural development sources

began on Natura 2000 forest sites, as one of the forms of recognition of the public services of forests.

Some progress has been made in forest exploitation relating to silviculture with the regulation of collection, but the other forms of trade and utilisation are often not sufficiently regulated, and therefore many species are at risk of excessive utilisation due to illegal collection (certain herbs and large mushrooms collected for nutrition purposes).

2.1.10 Game management

Hungary's game stock has changed significantly over the recent period. The population of certain species expanded a great deal, while of others has shrunk or even disappeared. The estimate and dissemination data of indigenous large games (red deer, roe deer, wild boar) are increasing continuously (Figure 11) and large populations have also developed from two non-indigenous species (fallow deer, moufflon). **The spread of large game is likely to durably exceed 300,000 specimens/year.** Although some attempts have already been made to prevent the increase of the population, no durable effect has been achieved. The size of the large game population is much greater than the density of specimen that can be maintained in a natural environment without any major conflict; **game damage is rather extensive** (in certain regions, forests cannot be planted, natural forest reconstruction cannot be conducted and food cannot be grown without a fence), to stop any further increase and to reduce the population of large game approximately 400,000-500,000 specimen should be utilised. The length of deer fence is important because, apart from contributing to the fragmentation of a habitat or, particular cases, the dissemination of weed, it increases game damage and disturbs the migration route of the games and other animal species. At the same time, the grassland near forests could ultimately be used for game grazing. Professional pasture management also contributes to the preservation of biodiversity on these areas.

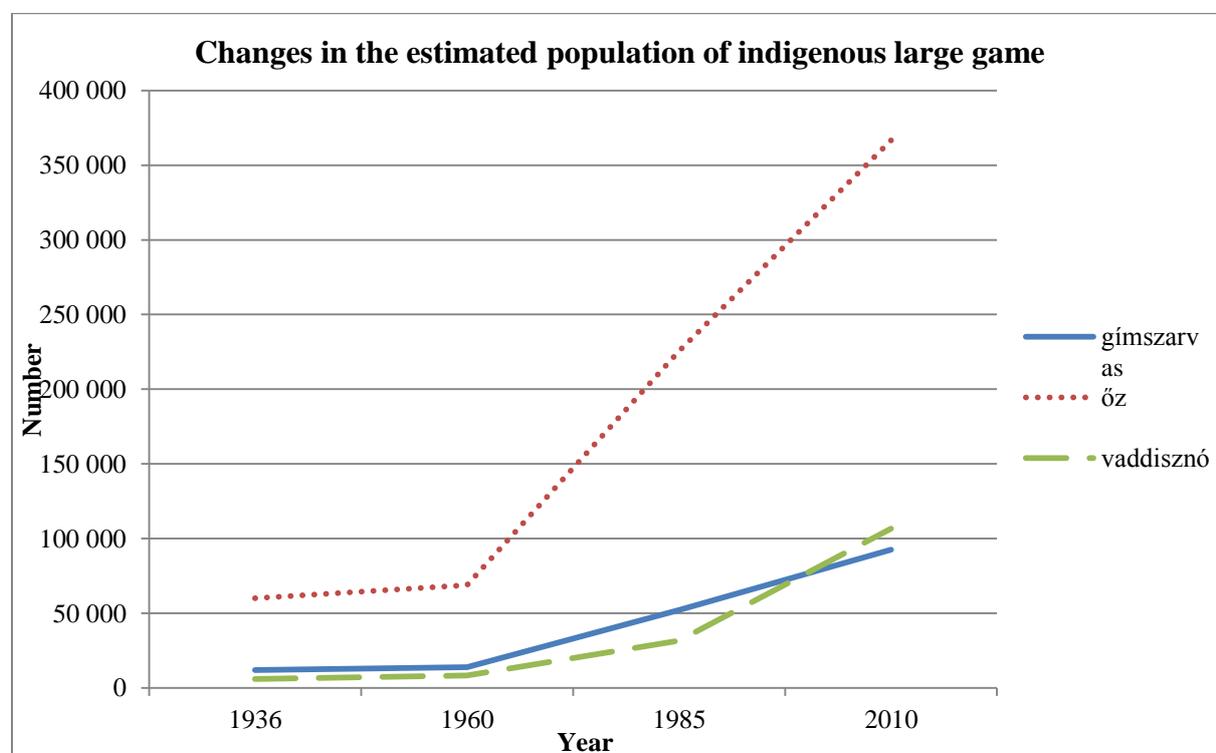


Figure 11.: Variation in the estimated population of indigenous large game species (Source of data: Natural Hunting Database)

gímszarvas

Red deer

<i>őz</i>	<i>Roe deer</i>
<i>vaddisznó</i>	<i>Wild boar</i>

However, in the case of **small game contrary processes** can be observed. The hare population shows some apparent stability at just 25 percent of the size of the original population, while the partridge is at direct risk of extinction, as practically no viable population has been left from the species (Figure 12). The main reason behind the decrease is the loss of habitat, because agriculture used for decades and still continues to use methods that eliminate the habitats of these species. Turning round these processes will be a task of key importance in the subsequent period. It should be noted that the hare and the partridge are excellent bio indicators of agricultural and environmental biological diversity.

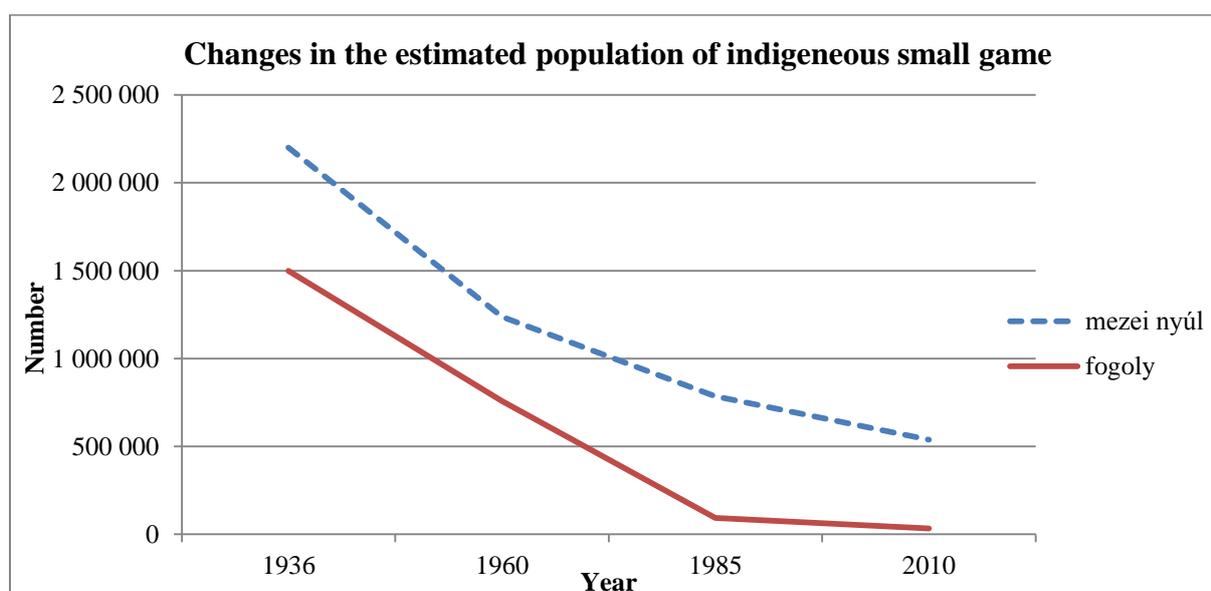


Figure 12.: Variation in the estimated population of indigenous small game species (Source of data: Natural Hunting Database)

<i>mezei nyúl</i>	<i>hare</i>
<i>fogoly</i>	<i>partridge</i>

Waterbirds cannot be protected without national collaboration, because in our region all species migrate extensively. Besides the increasing Greylag Goose breeding population, **the breeding population of almost all Hungarian wild duck species is diminishing**. In terms of their protection in Hungary, not only the network of protected and Natura 2000 sites should be maintained but the protective territorial system of the waterbirds should also be operated. In addition, Hungary's interest enforcement ability must be increased in order to ensure that wider international collaboration protects the species from international excessive utilisation and the loss of their habitats.

2.1.11 Fish farming

Owing to its hydrographical features, Hungary boasts a fish stock of outstanding value even in a European comparison. More than 90 round mouth and fish species are known in Hungary, but the ratio of indigenous species is just two-thirds of that figure. This ratio is significantly worse than observed in relation to the other vertebrate groups. Although the ratio is better in terms of specimens, in numerous Hungarian waters non-indigenous, imported and introduced invasive fish species make up a considerable portion of all fish.

During the assessment of the Hungarian fish fauna, the fact cannot be disregarded that the majority of our waters originate outside the Hungarian borders and leave the country, crossing its borders. In relation to species, typical in upper sections of rivers there is no information as to whether or not they have populations, capable of propagation in Hungary at present or only some occasional specimen add another feature to the fish fauna. Of the almost **sixty indigenous species by now six have completely disappeared from our waters** (not installed specimen of sturgeon, starry sturgeon, bustard sturgeon, Danube large herring and eel) **as naturally existing species**. They cannot reach the Hungarian waters due to the habitat transformation south of the country border (primarily the construction of the power plant at Vaskapu), and the excessive fishing conducted abroad. A truly effective protection and preservation of these species cannot be achieved without international collaboration.

Another especially endangered group is a group of species constituting the fauna of the hill streams, which is mostly at risk by the major shortage of water, which occurs due to the varying climate. No protection can be provided against that effect by simply implementing this strategy either. However, we can do a lot, even at national level, for the protection of the third endangered group, i.e. the group of species typical of boggy habitats, as such species can be saved by protecting the habitats and by preventing the non-indigenous species getting into the water.

It is an obvious process that on the Hungarian natural waters, the importance of fishing is decreasing and angling is becoming more important. Apart from the major economic activities relating to angling, the stronger relations between towns and the countryside and people and the natural environment cannot be disregarded either. At the same time, a large amount of anglers live in towns who can relax in a favourable rural environment on the shore of a lake or by a water course, also providing meaningful entertainment for their families. Apart from the preservation of traditions, fishing may also ensure the marketability of the fish relating to the particular reason, thus contributing to the development of healthier nutrition habits. However, both types of utilisation require development activities that increase the size of the fish population available for fishing by promoting natural propagation and, when necessary, with the release of fish. At the same time, the alteration of the structure of the populations introduced to a particular habitat. On the one hand, non-indigenous species should not be left even accidentally in the introduced population, and the ratio of original wild carp, which is the fish species introduced in the larger quantity, should be enhanced. In relation to that species a system of preservation of the most endangered Hungarian special should also be elaborated. In addition, any activity that reduces unlawful catching of fish should be supported.

2.1.12 Water management

The pressure on our water and water related ecosystems is increasing: the nutrition load of natural waters, the degradation of the riverbeds and the decrease of the volume of water lead to a decline in biodiversity which, in the long term, will also have a major impact on the ecosystem services provided by them. The straightened riverbeds and reduced, often different purpose utilisation of flood plains is favourable for the dissemination of non-indigenous and invasive species. As a cumulative effect of these processes, the chance of survival of natural vegetation and the fauna decreases.

It is a specificity of the country's hydrography that 95% of our surface waters originate from beyond the country borders, and therefore the effects stemming there from cannot be ignored, similarly to the fact that the surface waters and water flows leaving Hungary also have an impact on biodiversity in other countries.

In the case of major water bodies involved in regulation (primarily Danube in Hungary), it is a significant problem that the alluvium depositing and alluvium grasping features, which previously had a dynamic balance, have disappeared and the alluvium grasping capacity of the river increased significantly. As a consequence, the bad segments developed on loose alluvial strata began to develop cuts at a rapid pace. As a result of this and often excessive dredging, the bed began to sink significantly, which causes a fundamental problem that the embedding of the riverbed accelerates the isolation of branches and backwaters from the main riverbed. The cuts in the riverbed also entail the lowering of the water level, which also leads to the reduction of groundwater levels. This the **continuous sinking of the riverbed** has a direct impact on the gradual drying of the islands of the river and the riverbank areas, on the transformation of natural habitats and, in the long term, it may lead to the drying up of branches and backwaters or to their development into stagnant waters.

The Water Framework Directive (WFD) creates a legal framework for the protection of mainland surface waters, transition waters, shore line waters and sub-surface waters. The WFD is important primarily because it provides a consistent framework regulating the protection of surface and sub-surface waters in terms of quantity and quality, actions against point and diffuse sources of pollution and sets a requirement for the coordination of the measures required for achieving a good condition of waters at water catchment area level. The provisions of the WFD must be implemented in an integrated fashion, by using the tools of water catchment area management plans, with the involvement of the stakeholders.

The implementation of the measures of the Water Catchment Area Management Plan (WCMP) significantly contributes to the preservation of natural assets. At present, the ratio of the **water flow bodies in good ecological condition is 8%** according to the WCMP (Figure 13), **while the similar ratio is 18% for lake water bodies (stagnant waters), and 68% for sub-surface waters**^{19 20} (Figure 14).

¹⁹ National Rural Strategy (2010)

²⁰ EEA ETC/ICM technical report for more details and the methodology used for assessing ecological status and pressures (EEA ETC/ICM 2012a)

Folyóvizek ökológiai állapota és a terhelt (átalakított, szennyezett) folyóvizek aránya Európában

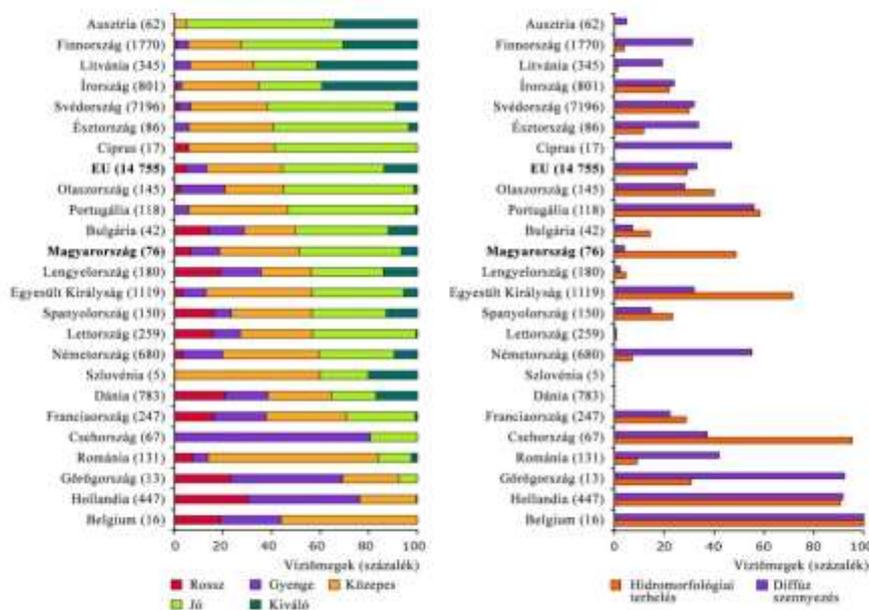


Figure 13.: Ecological condition of rivers and ratio of burdened (transformed, contaminated) rivers in Europe (2012)

Állóvizek ökológiai állapota és a terhelt (átalakított, szennyezett) állóvizek aránya Európában

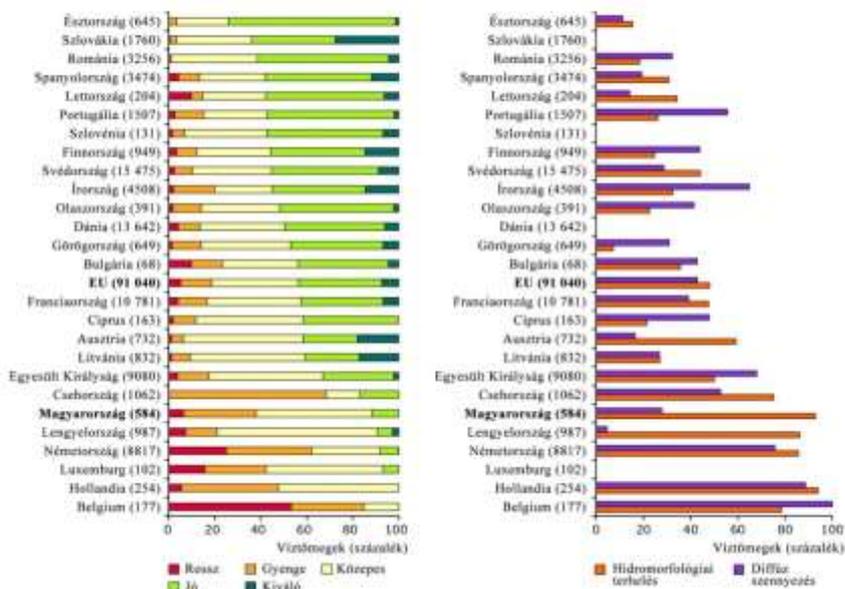


Figure 14.: Ecological condition of stagnant waters and ratio of burdened (transformed, contaminated) stagnant waters in Europe (2012)

<i>Folyóvizek ökológiai állapota és a terhelt (átalakított, szennyezett) állóvizek aránya Európában</i>	<i>Ecological condition of rivers and ratio of burdened (transformed, contaminated) rivers in Europe</i>
<i>Ausztria</i>	<i>Austria</i>
<i>Finnország</i>	<i>Finland</i>

<i>Litvánia</i>	<i>Lithuania</i>
<i>Írország</i>	<i>Ireland</i>
<i>Svédország</i>	<i>Sweden</i>
<i>Észtország</i>	<i>Estonia</i>
<i>Ciprus</i>	<i>Cyprus</i>
<i>EU</i>	<i>EU</i>
<i>Olaszország</i>	<i>Italy</i>
<i>Portugália</i>	<i>Portugal</i>
<i>Bulgária</i>	<i>Bulgaria</i>
<i>Magyarország</i>	<i>Hungary</i>
<i>Lengyelország</i>	<i>Poland</i>
<i>Egyesült Királyság</i>	<i>United Kingdom</i>
<i>Spanyolország</i>	<i>Spain</i>
<i>Lettország</i>	<i>Latvia</i>
<i>Németország</i>	<i>Germany</i>
<i>Szlovénia</i>	<i>Slovenia</i>
<i>Dánia</i>	<i>Denmark</i>
<i>Franciaország</i>	<i>France</i>
<i>Csehország</i>	<i>Czech Republic</i>
<i>Románia</i>	<i>Romania</i>
<i>Görögország</i>	<i>Greece</i>
<i>Hollandia</i>	<i>Netherlands</i>
<i>Belgium</i>	<i>Belgium</i>
<i>Víztestek (százalék)</i>	<i>Water masses (percentage)</i>
<i>Rossz</i>	<i>Bad</i>
<i>Jó</i>	<i>Good</i>
<i>Gyenge</i>	<i>Weak</i>
<i>Kiváló</i>	<i>Excellent</i>
<i>Közepes</i>	<i>Average</i>
<i>Hidromorfológiai terhelés</i>	<i>Hydromorphological load</i>
<i>Diffúz szennyezés</i>	<i>Diffuse pollution</i>

In Hungary **71.5% of the total wetland is part of the Natura 2000 network**²¹. On the basis of the objectives of the Nature Conservation Directives and the WFD, Hungary is obliged to maintain healthy water ecosystems and to create balance between water management and the protection and sustainable use of nature, as well as the utilisation of natural resources.

However, the nature conservation status of the majority of the natural water habitats in Hungary is bad. One of the most important risk factors is the lack of water, which is a consequence of human effects and a change in the natural water flows. These habitat types are also more exposed to the impacts of the climate change. According to the Ramsar Convention on wetlands, Hungary has **29 Ramsar sites, with a total territory of 243,000 hectares**. Development of the existing Ramsar sites to preserve biodiversity, improvement of the natural features of the saline lakes and their adequate management are priorities.

In order to facilitate the re-vitalisation of flood plains, branches and backwaters closed off with dams cross transferability improvement is also an important task (the territory of flood plains have reduced by 80 percent) because, owing to Hungary's situation, the country is rich in surface waters, 19% of its potential vegetation would be flood plain forests, but, as a result of the river regulation and flood plan elimination works of the last few centuries, their territory has been reduced to 0.8%. The dams constitute the main transferability barrier on the length of the rivers, the additional impacts of which (speed, insufficient water flow, water level, unfavourable alluvium conditions) affect the good condition and revitalisation capacity of the water and water-related ecosystems.

²¹ Corine Landcover (2006)

2.1.13 Invasive alien species

As a result of deliberate or accidental introduction of numerous plant and animal species far away from their original home and natural area of occurrence, as well as fast dissemination, they reduce the variety of plant and animal communities indigenous on a particular area (biodiversity) through predation or competition, making the habitats poorer. The dissemination of such invasive species is one of the most important factors imposing a threat to natural and semi-natural habitats. International trade, transportation, travelling and increasing tourism through increasingly open borders also make it easier for such species to reach areas other than their natural area of existence. It is a direct consequence of the increasingly frequent introduction that the dissemination of non-indigenous species and an increase in the number of their specimen will also exponentially raise the possibility of future potential successful introduction. The invasive species significantly transform their environment because e.g., they impede the reproduction, germination, specimen development of other species (shading, removal of nutrition, dissolving materials) carry diseases and, by pushing out the indigenous plant species, reduce or completely terminate the nutrient base of the local fauna, certain species eat up specimen of other species, while other may cause damage by competing with them or by terminating the genetic isolation between species i.e., by crossing between species. However, apart from the negative effect of invasive species on the natural environment, we cannot ignore that such species have a major detrimental impact on human health and quality of human life (e.g., plants causing allergy), tourism and economic activities, and therefore it may be concluded that the competitiveness of countries and regions strongly infected by some species is reducing.

Protection against such invasive species is a nature conservation and economic task of major importance all over the world, including also Europe and Hungary. The Bern Convention on the protection of European wild life and natural habitats was the first international agreement that contained provisions for the strict control of introduction and establishment of non-indigenous species. In order to eliminate important factors that reduce biodiversity, the European Commission published a proposal for an EU Regulation²² in which it summarised the tasks relating to invasive species in one single document on 9 September 2013. The Regulation of the European Parliament and of the Council No. 1143/2014/EU, adopted on 22 October 2014, on the prevention and management of the introduction and spread of invasive alien species entered into force on 1 January 2015.

In order to satisfy the EUR requirement, in Hungary work began on the collection and classification of research and management experience related to invasive species, based on which a Hungarian list of invasive species was also prepared. The Hungarian legal regulations on invasive species prohibit the unauthorised introduction of living organisms, new in terms of plant and animal geography and provide for the need to maintain weed free condition of agricultural areas, as well as on mandatory protection against certain invasive species.

A list of Hungarian invasive animal and plant species for nature conservation purposes was prepared under the coordination of the Ministry of Agriculture with the main objective of defining those Hungarian neofiton species (species introduced to Hungary after the last Ice Age) in relation to which active intervention is required in order to protect the natural flora and fauna as they impose a threat to the indigenous ecosystem of the Carpathian Basin.

²² Number of the document of the European Commission: COM(2013) 620 final

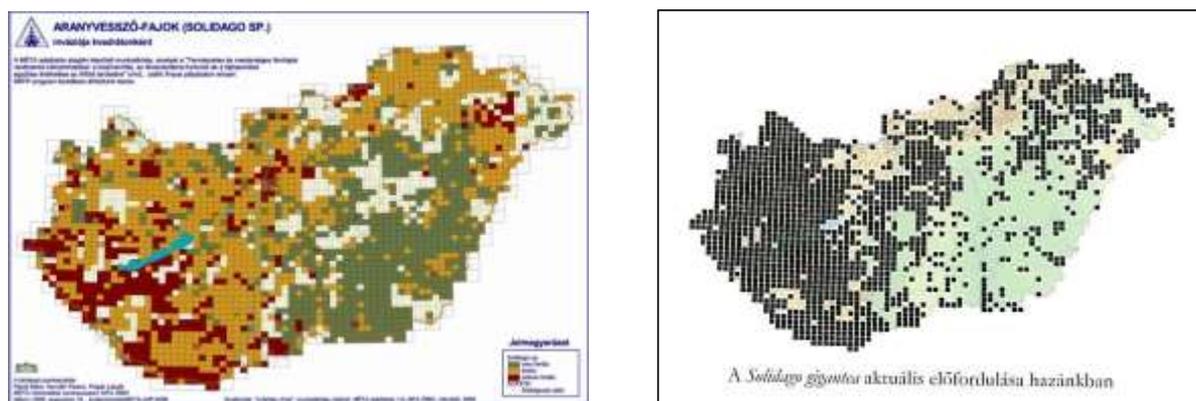
At present the list of land and water invasive plants that are a threat to nature conservation include **33 land and 8 water plant species** that are not indigenous in Hungary and their presence in natural and semi-natural habitats is a threat to the indigenous flora and fauna.

Of the 33 land invasive non-indigenous plant species **17 species are listed that represent an especially high ecological risk.**

At present **the list of invasive alien animal species include 35 species:** 4 mammals, 13 fish, 1 beetle, 3 crab and 12 mollusc species. Among those the Chinese sleeper, the cyprinid fish and goldfish **represent especially large ecological risks.**

In relation to the invasive alien animal species a separate list includes the **19 animal species** and groups that **have not yet settled in Hungary** but represent an ecological threat to the Hungarian flora and fauna according to our current knowledge. The lists are available on the official website of nature conservation²³. The species list may change dynamically because new species may be introduced in Hungary but, as a result of successful defence, certain species may also disappear from the territory of our country.

The degree of the problem caused by invasive species is illustrated well by the fact that **13.1% of natural and semi-natural habitats and areas is already heavily infected with invasive species.** On the basis of the data generated in the habitat map programme of the National Biodiversity Monitoring System (NBMS) over the last 10 years, it may also be concluded that the invasive plant species representing a risk in terms of nature conservation take up an increasingly large areas within the sampled squares and new invasive species occur (Map 5)²⁴.



Map 5. : The maps illustrating the existence of golden rod species is a good example to present the dissemination of invasive species (from 1996 and 2012)

The words are illegible

In Hungary fight against invasive species takes place in several areas, including national park directorates, farmers and civil organisations, which kill invasive species by using funds originating from various sources primarily in relation to different nature conservation management (habitat reconstruction). The national park directorates kill invasive plants primarily on areas with high nature conservation value, subject to nature conservation protection and managed by them, typically in order to preserve certain species (e.g., Rákos viper, diuthius), or habitats (e.g., sandy grassland) valuable in terms of nature conservation

²³ <http://www.termeszetvedelem.hu/ozonfajok-magyarorszagom>

²⁴ MÉTA, Csiszár, Á.: Invasive Plant Species in Hungary [Inváziós Növényfajok Magyarországon] (2012)

purposes. The amount used by the national park directorates to kill invasive plant species and the managed area are difficult to estimate because in general the management is consolidated with other tasks. In addition, the amount allocated to the elimination of such species and the size of the managed area vary a great deal each year due to the extremely heterogeneous ownership structure, the various degree of infection of the area of operation of the directorates and different financing terms and conditions and application opportunities, varying approximately from a few hundred hectares to a few thousand hectares.

The huge reproduction capacity of the particular plant species i.e., the extremely fast and strong asexual (vegetative) and/or sexual (generative) reproduction and fast germination capacity of the particular plant species is a major problem. Thus, often a single treatment within one vegetation period is not sufficient, in general only a long-term treatment can be effective and often destruction with pure mechanical instruments is not feasible; in addition, the presence of protected values calls for special treatment (e.g., lubrication technique, point spraying). It is a major problem that the treated area can be re-infected from any neighbouring unprotected area which has not been treated. Thus, the elimination of invasive species from a particular area requires a great deal of energy.

Any action against invasive alien animal species that are a threat in terms of nature conservation is even more difficult when at all possible than the actions which may be taken against invasive plant species. One of the reasons for that – among others – is the capability of changing locations, the fact that the area of occurrence cannot be clearly defined, as well as the lack of selective destruction method.

Prevention of dissemination of invasive and alien species and the required education, as well as creating awareness of the problem are especially important due to the extremely high cost and often low efficiency of protection (the best example for that is protection against ragweed), which is why the “Invasive Species in Hungary” website was launched, on which everyone can find information about the problem caused by invasive alien species and protection and prevention options.

Hungary was among the first countries that joined the European initiative as a test country to try and collect data on the occurrence of invasive species with an on-line data collection programme and extensive involvement of the society. The NatureWatch programme of the European Environmental Agency may make a major contribution to the fight against invasive species not only with the data collection that requires a large amount of human resources, but also by educating the population. The results achieved in that area can make an important contribution to the competitiveness of the country.

2.1.14 Genetically modified organisms

Genetically modified organisms (hereinafter: GMO) are artificially produced creatures that could not have evolved naturally. It is a major problem that the currently existing GMOs (primarily the grown genetically modified GM plants) were released on the market too soon and too fast, without the required safety tests. Even though they were first launched for distribution long time ago, the potential risks and long-term effects have still not been assessed carefully. Due to the large number of types and different application purposes of these organisms, there are also various risk factors (e.g., environmental, ecological, health, social and economic risks). At present the principle of prudence is not applied sufficiently across the world in the course process monitoring and the assessment of potential impacts and risks. Uncontrolled release of GMOs into the environment is a further risk, irrespective of whether it takes place in the form of experimental release or distribution, strict control of laboratory activities, or the management of waste generated during gene technology activities.

According to the results of numerous scientific publications, the GM plants have a harmful effect to soil, surface waters and the ecosystem thereof. Specific negative impacts have already been detected in certain species (e.g., caddis flies, crane flies, isopods, water fleas, butterflies, snails, beetles and rodents). At present two land experiments are authorised in Hungary for the purposes of an environmental impact study. As the impact of GMOs has been proved in extremely various classification categories, mezzo-cosmos studies modelling the complete ecosystems should also be conducted instead of focusing on specific species.

Due to its different environmental features, the new ecological region appearing in the European Union with Hungary's accession known as the Pannonian biogeographical region raises strong doubts about the validity of a risk analysis that takes into account the ecosystems of the existing Member States. This region is significantly different from the Western and Central European areas with intensive land use, different climate and vegetation. Our agricultural areas and agro-ecosystems are more versatile than the comparable areas of the regions referred to above. There are numerous protected species in Hungary that have an important role in the grass ecosystem, vegetation and soil and exist primarily or exclusively in the Carpathian Basin. The tests on these species are required and can only be conducted here. That is why **the Hungarian environmental impact studies** are absolutely required for the GMOs that have already been licensed or are in the process of being licensed **due to the different environmental features of our region**. Another reason why it is required is that according to the currently effective EU regulations, a particular Member State may prohibit growing or utilisation for other purposes of a particular GMO, if it can confirm its harmful effect with sufficient scientific reasoning.

The first generation GM plans developed for agricultural production were entered into general production approximately 20 years ago. 90% of the total territory covered by GM plants are in five countries: United States, Argentina, Canada, Brazil and India²⁵. In the EU, the growing of only one GM plant, the MON810 sweet corn, is permitted, but it is used in general production only on a small area (Map 6). The growing of this GM sweet corn has been prohibited in Hungary for almost ten years. The European Court annulled its decisions approving and authorising the general production of Amflora potato in December 2013. Hungary challenged the authorisation at the Luxembourg court claiming that the genetically modified potato was a threat to the health of people and animals. The Hungarian position was also supported by France, Luxembourg, Austria and Poland. In their judgment the judges concluded that the Commission had severely violated the rules of the authorisation procedure and therefore annulled the previously issued authorisations.

Until 30 October 2014 the EU authorised the utilisation (i.e., concerning the imported final product and not production) of 59 GM plants and micro organisms for food, fodder and other purposes, and the authorisation procedure is in progress in relation to 24 other GM products (mainly sweet corn, and also cotton, soy, rap and rice). In the EU the procedure also authorising the growing of another GM sweet corn has reached its final phase. In Hungary numerous studies and surveys have clearly indicated that the majority of the population and the farmers reject the use of GM plans in agriculture^{26,27} and the food industry²⁸. The majority of Hungarian consider GM food unnatural, inappropriate in terms of health and economic

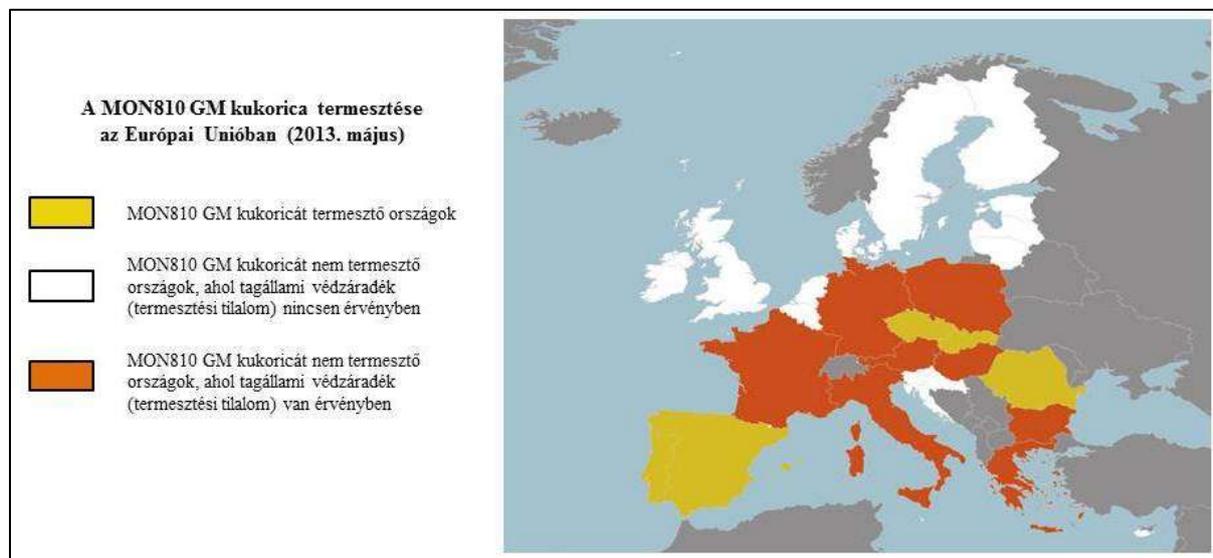
²⁵ <http://gmo.kormany.hu/download/6/fe/60000/GMO-Roadshow-2012-kiadvany.pdf>

²⁶ GMO Roadshow 2012, questionnaire survey, Ministry of Rural Development

²⁷ Haszon Magazine, survey via phone, November 2011. <http://www.haszon.hu/agrar/noevenytermesztes/723-gmo-koerkerdes-.html>

²⁸ Europeans and Biotechnology in 2010. Winds of change? A report to the European Commission's Directorate-General for Research. http://ec.europa.eu/public_opinion/archives/ebs/ebs_341_winds_en.pdf

aspects and harmful to the environment and biodiversity. In addition, they also have major concerns about their safety²⁹. The GMO free items have a great advantages in the sowing seed, as well as the food industry. Consequently, a GMO free strategy is extremely important and advantageous for Hungary not only in terms of nature conservation, but also as an economic incentive, because that can guarantee the competitiveness of our products on the global market and help us acquiring new markets.



Map 6.: Growing MON810 GMO sweet corn in the European Union (2013)

<i>A MON810 GM kukorica termesztése az Európai Unióban (2013. május)</i>	<i>Countries growing MON810 GM sweet corn in the European Union (May 2013)</i>
<i>MON810 GM kukoricát termesztő országok</i>	<i>Countries growing MON810 GM sweet corn</i>
<i>MON810 GM kukoricát nem termesztő országok, ahol tagállami védzáradék (termesztési tilalom) nincsen érvényben</i>	<i>Countries not growing MON810 GM sweet corn, where Member States protective clause (prohibition of growing) is not in effect</i>
<i>MON810 GM kukoricát nem termesztő országok, ahol tagállami védzáradék (termesztési tilalom) van érvényben</i>	<i>Countries not growing MON810 GM sweet corn, where Member States protective clause (prohibition of growing) is in effect</i>

Of Hungary's neighbouring countries Austria, Slovenia, Croatia, Serbia and the Ukraine also follow GMO free strategy. However, in the territory of Slovakia and Romania GM plants are grown. In order to be able to preserve our GMO free areas also by the borders and to maintain local biodiversity, increased controls should be required specifically in those areas. It is an undisputable fact that if such organisms are released into the environment, they cannot be withdrawn. That is why it is very important to prevent the dissemination of GMOs by applying the principle of prudence as much as possible, thus protecting our unique, natural assets.

2.1.15 Species endangered by trade

In terms of the diversity of the ecosystem, international trade involving wild animal fungus and plant species is an important threat as it affects thousands of species and has pushed some of them to the verge of extinction. In order to ensure that this activity does not have any harmful impact on biodiversity, since 1973 an international convention has been regulating

²⁹ Special Eurobarometer Biotechnology Report (2010) Eurobarometer 73.1. Conducted by TNS Opinion & Social on request of European Commission. http://ec.europa.eu/public_opinion/archives/ebs/ebs_341_en.pdf

the international trade of endangered species. Hungary joined the Convention on International Trade in Endangered Species (CITES) of wild fauna and flora in 1985 and an outstanding role in its implementation in the Central and the Eastern European. As a **transit route** as a **purchasing country**, Hungary has an important role in controlling the international traffic transiting or arriving on our territory. At the same time, some animal and plant species also exist in Hungary (wolf, lynx, otter, predatory birds, owls, sturgeons, medical leeches, orchids, snowdrops, forest cyclamen, peasant's eye, etc.), which are in demand in trade but their protection from its harmful impacts is our major responsibility. The majority of these species are subject to nature conservation protection, and therefore they cannot be used for commercial purposes in Hungary.

Endangered **sterlet**, which is still very widely spread in the water system of the River Danube is an exception, as its meat, salted roe (caviar) and its live offsprings are very popular for aquarium purposes. At the same time, **we do not have enough information about the status, development or impact of the utilisation on the population** of wild species, based on which a decision could be made as to whether the trade in the species is sustainable or not. Without such data or information, it cannot be concluded either whether the trade has any detrimental impact on the wild population of the species, i.e. a "*Non-Detriment Finding*" cannot be issued certifying that the degree of acceptance and utilisation is sustainable, as a prerequisite of international trade pursuant to CITES.

Hungary joined the EU in 2004, where the CITES requirements are implemented consistently as a common economic area. Considering that the customs control was lifted on internal borders, the guarding and control of external borders is an enhanced responsibility of Member States having external border sections, including also Hungary. In addition, much more emphasis must also be laid on internal controls because if anything unlawfully enters the EU through any of its borders, it can be eliminated only with internal controls. Based on designation by the law, the environmental and nature conservation authorities, customs agencies, the police and the animal and plant health authorities have an important role in such controls. In order to make sure that the employees of the respective authorities responsible for controls have the knowledge required for conducting controls, more stress must be put on their regular training and further training. In order to promote compliance with the law and to detect and prevent unlawful actions, in **2011–2012** the environmental, nature conservation and water management supervisions conducted **171 inspections** in this field. Extensive information to the public, presentation of the impacts of uncontrolled trade on biodiversity in order to promote and encourage compliance with the law continues to be an important task.

2.1.16 Access to genetic resources and fair and equitable sharing of the benefits arising of their utilisation

The 193 signatories of the Convention on Biological Diversity approved the Nagoya Protocol on access to genetic resources and a fair and equitable sharing of benefits arising from their utilisation unanimously approved at the end of 2010. According to the international regulation, the benefits of utilisation of genetic resources and their further application and trade must be shared, fairly and equitably, with the party providing such resources, i.e., with the country of origin of that resource. Pursuant to the Protocol, utilisation refers to any research and development relating to the genetic and/or biochemical composition of genetic resources.

Hungary was the first Member State of the European Union to ratify the Protocol on 29 April 2014. The 50th ratification then took place in July 2014, allowing the entry into force of

the Protocol on 12 October 2014.³⁰ The European Parliament and Council adopted Regulation No. 511/2014/EU on compliance measures for users from the Nagoya Protocol on access to genetic resources and a fair and equitable sharing of benefits arising from their utilisation on 16 April 2014. However, that regulation does not extend to the regulation of access to the genetic resources available in the EU Member States, which is an issue falling within the competence of the respective Member State. The regulation must be applied from the date of entry into force of the Protocol i.e., from 12 October 2014.

Hungary has an extremely rich ecosystem in European comparison, although it is not among the countries with the most diverse ecosystems on a global scale. Primarily the abundance of microorganisms, genetic resources for food and agriculture and the indigenous species existing only in Hungary (endemisms) should be highlighted. Hungary is affected both as the possessor and provider of genetic resources and their utilisation, but it is unlikely that Hungary will be included among the main source and target countries in relation to the activities with genetic materials falling within the scope of Protocol.

2.1.17 More extensive enforcement of biodiversity conservation criteria in the course of international financing

On the 11th conference of the Convention on Biological Diversity, a decision was made in 2012 that, relative to the average within the period between 2006 and 2010, the biodiversity support disbursed to developing countries will be doubled by 2015 and maintained at the same level until 2020 globally. At the same time, the countries using the funds must put special emphasis on the preservation of biodiversity in the elaboration and implementation of development plans.

Hungary enforces the international development cooperation policy also during its aid lending practice. For the time being the tasks specifically dedicated to the preservation of biodiversity are not yet reflected in it.

2.2 Analyses of strengths, weaknesses, opportunities and threats

Based on a detailed status analysis, the SWOT analysis (Table 4) briefly describes the biodiversity situation in Hungary to reveal the specificities that may be deemed strengths or potential opportunities and those that are missing or are inadequate, or appear as specific risks.

Strengths	Weaknesses
<ul style="list-style-type: none"> - variable ecological features, favourable in terms of biodiversity - unique character of the Pannonian biogeographical region - natural assets, outstanding also in a European comparison - variable habitats and versatile landscapes - favourable species diversity in a European comparison - diversity of variable genetic resources 	<ul style="list-style-type: none"> - dominance of short-term economic interests over medium and long-term environmental, social and economic interests - excessive use of the environmental systems - reduction, fragmentation, deterioration and shrinking of natural and semi-natural habitats (e.g., extensive grassland, wet habitats, forests on the Great Plain) - economic activities, often ignoring ecological features - the continuation of ecological and landscape

³⁰ <http://www.biodiv.hu/news/>

<p>still available on rural areas of the country and kept in gene banks and versatile landscape types</p> <ul style="list-style-type: none"> - protection of GMO free agriculture by constitution - legal and institutional system promoting the preservation of biodiversity 	<p>ecological relations between protected areas is not guaranteed</p> <ul style="list-style-type: none"> - high ratio of habitats and species of unfavourable nature conservation status - the majority of the Hungarian natural habitat types are in an unfavourable situation - the nature conservation status of species associated with the agri-ecosystem is usually unfavourable in the Pannon biogeographical region - extensive dissemination of invasive species - low ratio of areas covered by natural forests in a European comparison - the size of forests consisting of indigenous tree species is inadequate - large intensive arable land cultures - degradation of the life of the soil - existing light pollution - appearance of seeds, contaminated by GMOs on the Hungarian sowing seed market - growing of MON810 GM sweet corn is not prohibited in almost 50% of the Hungarian borders (Slovakia, Romania)
Opportunities	Threats
<ul style="list-style-type: none"> - EU resources available for the implementation of the Strategy - greening of the Common Agricultural Policy - increasing social need for a lifestyle that takes into account environmental and biodiversity protection aspects - easier mobilisation of companies to support specific biodiversity protection projects in order to strengthen the environmental/green image of companies - increasing forest areas - further dissemination of semi-natural silviculture - extensive spread of ecotourism and related job creation - educational and awareness creation potential of national parks, collection gardens and public collections, most of which has not yet been used - convergence of underdeveloped regions with nature friendly economic activities - development of a common regional policy with neighbouring countries 	<ul style="list-style-type: none"> - the objective is competitive growth based on natural capital, and the current consumer society is not prepared for the full change of attitude, which is required for long-term preservation of biodiversity - the aspects of preservation of biodiversity have not been integrated into the sectoral policies at all, or to a satisfactory extent - the environmental load triggered by social and economic development exceeds the bearing capacity and flexibility of the environmental systems - increase in extreme climatic events - extensive dissemination and introduction of invasive alien species - increasing space demand of infrastructure and capital investments - unfavourable land use strategies - more intensive use of areas with low productivity and abundant biodiversity - unsustainable increase in the utilisation of biomass for energy purposes - termination of national gene exchange due to the isolation of habitats

applying a GMO free strategy - support to small and medium-sized enterprises promotes the development of a more versatile landscape structure and protection of natural assets	- loss of Hungary's GMO free status
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Table 4.: SWOT analysis (2013)

In comparison, it may be concluded that Hungary has outstanding natural assets and versatile species and habitats in Europe. However, the global tendency also applies to Hungary, whereby the factors causing the decay and destruction of biodiversity have accelerated and become more severe than the development and implementation of the political measures aimed at managing the deterioration.

3 THE STRATEGY

3.1 Future vision

The National Biodiversity Strategy intends to outline a future vision, the attainment of which will ensure the continuation of Hungary's ecosystem, which is versatile on a European scale.

Future vision set for 2020:

Halting the loss of biological diversity and further decline of ecosystem services in Hungary by 2020 and to improve their status as much as possible.

The main objective of the Strategy is to integrate the aspects of preserving biodiversity into cross-sectoral policies, strategies and programmes and in their implementation. In order to achieve that, the National Biodiversity Strategy sets out the following objectives, goals and measures for their attainment.

The Strategy defines the objectives, goals and measures, the attainment and implementation of which is indispensable by 2020. The attitude of the whole mankind must be changed in order to achieve long-term results in the preservation of biodiversity.

3.2 The Strategy

Strategic field I: Preserving the country's natural areas and values, and improving their conservation status; creating the conditions for the comprehensive implementation of the European Union's Birds and Habitats Directives

Measurable Objectives	Measures directly relating to the Objectives	Indicators
1. objective: Improving the condition of Natura 2000 sites as well as protected natural areas and those subject to international environmental protection treaties, and ensuring satisfactory environmental management		
1.1 As a result of developments aimed at habitat reconstruction and better infrastructural conditions to environmental management, the status of natural values of at least 95,000 hectares of Natura 2000 sites (including overlapping areas in other protection categories) is improving.	<ul style="list-style-type: none"> ➤ <i>Habitat development and reconstruction interventions aimed at preserving and improving the condition of habitat types of community importance as well as Natura 2000 sites and protected natural areas, as well as ex lege protected natural values. (related objectives: 1.1, 1.2)</i> ➤ Improving the infrastructural conditions necessary for the satisfactory management of Natura 2000 sites and protected natural areas. (related objectives: 1.1, 1.2) 	<ul style="list-style-type: none"> ➤ Sizes (in hectares) of Natura 2000 sites and protected natural areas affected by habitat reconstruction developments and management infrastructure development (related objectives: 1.1, 1.2)
1.2 In line with the European Union's objectives, the environmental condition of habitat types characteristic of the Pannonian region and significant from the Community's perspective is improving: the number of habitat types of favourable or improving environmental condition is doubled (increased by 100%).	<ul style="list-style-type: none"> ➤ Coordinating the (agricultural, forestry and fishing) subsidies available at Natura 2000 sites and protected natural areas with environmental protection objectives. (related objective: 1.2) ➤ Working out and implementing a methodology aimed at minimising the negative impacts of infrastructural investments that may have a significant effect on the value and condition of protected areas and Natura 2000 sites, as well as at compensating for the inevitable impacts, concerning the developments to be carried out in 2015-2020. (related objective: 1.2) 	<ul style="list-style-type: none"> ➤ Share of habitat types of community importance the environmental condition of which is favourable or improving (%) (related objective: 1.2) ➤ Number and size (in hectares) of Natura 2000 sites with maintenance plans or equivalent planning documents underlying environmental management (related objective: 1.3)
1.3 The environmental management of protected natural areas, ex lege protected natural values, and Natura 2000 sites (at 100% of their value) is based on duly compiled guidelines pursuant to the effective regulations.	<ul style="list-style-type: none"> ➤ Preparing maintenance plans or equivalent planning documents underlying the environmental management (management plan, district forest plan etc.) for Natura 2000 sites (related objective: 1.3) ➤ Preparing management plan documentation for protected natural areas of national significance, as well as ex lege 	<ul style="list-style-type: none"> ➤ Share of protected natural areas with an environmental management plan complying with the effective regulations (%) (related objective: 1.3) ➤ Number of ex lege protected environmental areas of key importance from the perspective of bio-diversity with a resolution
1.4 The conditions of safeguarding 50% of ex lege protected areas of key importance improve from the perspective of biodiversity.		

	<p>protected natural values (<i>related objective: 1.3</i>)</p> <ul style="list-style-type: none"> ➤ Collecting the data necessary to determine the geographical sizes of ex lege protected natural areas that are of key importance to bio-diversity; passing the resolutions on the sizes of those areas. (<i>related objective: 1.4</i>) 	<p>on territorial delineation (<i>related objective: 1.4</i>)</p>
<p>2. objective: Improving the environmental conditions of the most problematic species of community importance, as well as the most endangered species</p>		
<p>2.1 The environmental situation of species characteristic of the Pannonian region improves considerably: the number of species of favourable or improving environmental situation increases by 50%. The situation of species living under favourable conditions remains unchanged. No indigenous species will disappear from Hungary's flora or fauna until 2020.</p>	<ul style="list-style-type: none"> ➤ Preparation of plans aimed at improving the environmental condition of the most endangered species and/or species of community importance; review of the existing species preservation plans. (<i>related objective: 2.1</i>) ➤ Interventions aimed at improving the environmental condition of protected species and/or species of community importance (execution of species preservation plans). (<i>related objective: 2.1</i>) ➤ Placing habitats of key importance for species preservation (e.g. feeding, breeding and growing areas, as well as areas that serve as animal shelters in the winter) under strong protection (<i>related objective: 2.1</i>) ➤ Improving the natural state of ex lege or otherwise protected natural values (caves, artificial cavities and springs) that are of key importance for the preservation of certain species (e.g. bats). (<i>related objective: 2.1</i>) ➤ Taking the measures necessary for the protection of at least five habitats of each stringently protected species (or all habitats if there are less than five). (<i>related objective: 2.1</i>) ➤ Working out regulation and support systems aimed at preventing light pollution. (<i>related objective: 2.1</i>) ➤ Taking action against illegal acts related to protected wild animals and plants, such as illegal poisoning or hunting, intentional destruction of nests, or illegal collection. (<i>related objective: 2.1</i>) ➤ Working out and implementing systems for the naturally 	<ul style="list-style-type: none"> ➤ Number of protected species and species of community importance for which a species protection plan is available (<i>related objective: 2.1</i>) ➤ Share of species of community importance the situation of which is currently found favourable or improving (%) (<i>related objective: 2.1</i>) ➤ Share of natural or closely natural areas not affected by direct light pollution (%) (<i>related objective: 2.1</i>) ➤ Size of extensive or other fishing lakes managed in a near-natural manner (<i>related objective: 2.1</i>)

	<p>friendly management of extensive fishing lakes and the plants growing on their shores, as well as a related support system, in order to preserve the species living in and near aquatic habitats. (<i>related objective: 2.1</i>)</p> <ul style="list-style-type: none"> ➤ Continuing the Fishing Lake Environmental Management Program at extensive fishing lakes according to the local biological and geographical characteristics, for environmentally conscious management and a sustainable landscape usage. (<i>related objective: 2.1</i>) ➤ Preserving the genes pools of indigenous wild plant species, and long-term maintenance of the Pannon Seed Bank in order to complement the protection at natural habitats. 	
<p>3. objective: Developing a knowledge base serving the successful and effective preservation of species in need of protection and of community importance, as well as habitat types of community importance.</p>		
<p>3.1 The environmental situation of 100% of the species of community significance and the habitat types characteristic of the Pannonian region is checked via active monitoring programs.</p>	<ul style="list-style-type: none"> ➤ Improving the infrastructural and institutional conditions necessary for the satisfactory monitoring of protected species as well as species and habitat types of community importance, and continued development of the National Biodiversity Monitoring System, which already has 11 components. (<i>related objective: 3.1</i>) 	<ul style="list-style-type: none"> ➤ Share of species and habitat types of community importance for which tested monitoring protocols are in place (%) (<i>related objective: 3.1</i>)
<p>3.2 There is no species or habitat type of community importance where the information available about its environmental situation is incomplete.</p>	<ul style="list-style-type: none"> ➤ Assessing the ex lege or otherwise protected natural values (caves, artificial cavities and springs) that are of key importance for the preservation of certain species (e.g. bats). (<i>related objective: 3.1</i>) ➤ Determining the environmental state of species and habitat types of community importance knowledge about which is scarce. (<i>related objective: 3.2</i>) 	<ul style="list-style-type: none"> ➤ Share of species of community importance where any component in the current environmental situation assessment is “unknown” (%) (<i>related objective: 3.2</i>)
<p>3.3 The factors endangering species in need of protection as well as the reason for that need are known.</p>	<ul style="list-style-type: none"> ➤ Nation-wide assessment of the environmental situation of species of community importance living in Hungary, and compiling a country report about it at the end of the period. (<i>related objective: 3.2</i>) ➤ Identifying the factors endangering species in need of protection, and their environmental situation (<i>related</i> 	<ul style="list-style-type: none"> ➤ Share of endangered species the situation of which becomes known (%) (<i>related objective: 3.3</i>)

	<i>objective: 3.3)</i>	
4. objective: Improving public awareness and judgement of biodiversity, natural values of community significance, as well as protected natural areas and Natura 2000 sites via knowledge dissemination, attitude shaping , and interpretation.		
4.1 At least two thematic environmental interpretation sites are established every year in order to promote and provide information on activities aimed at preserving biodiversity, with at least one aiming to present a Natura 2000 site.	<ul style="list-style-type: none"> ➤ Development of the infrastructural background necessary to the interpretation of biodiversity, protected natural values and those under community importance, and Natura 2000 sites, with the involvement of the local communities. (<i>related objectives: 4.1, 4.2</i>) ➤ Presenting biological and landscape diversity as key topics at presentation sites and in public collections. (<i>related objective: 4.1</i>) 	<ul style="list-style-type: none"> ➤ Number of Natura 2000 sites with interpretation and information infrastructure (<i>related objectives: 4.1, 4.2</i>) ➤ Number of new environmental protection interpretation sites (<i>related objectives: 4.1, 4.2</i>)
4.2 Doubling the number of visitors and especially the ratio of local residents at events, interpretation sites and public collections related to the preservation of biodiversity (compared to the values measured in 2013).	<ul style="list-style-type: none"> ➤ Involving the local communities in the creation and operation of interpretation sites (<i>related objectives: 4.1, 4.2</i>) ➤ Defining a system of discounts and preferential offers to the local communities in order to promote that they should visit the interpretation sites and events. (<i>4.2</i>) 	<ul style="list-style-type: none"> ➤ Number of species and areas under protection or of community importance, affected by targeted attitude-shaping efforts (<i>related objective: 4.1</i>)
4.3 Increasing the number of participants in forest schools by 20% compared to the value measured in 2013.	<ul style="list-style-type: none"> ➤ Tracking the number of visitors to interpretation sites and events, as well as the share of the local community within the overall number of visitors. (<i>related objective: 4.2</i>) 	<ul style="list-style-type: none"> ➤ Number of visitors at interpretation sites aimed at preserving biodiversity, and share of the local residents (no. of people p.a., %) (<i>related objective: 4.2</i>)
4.4 The number of attitude-shaping publications of unified layout, presenting the efforts of national park directorates aimed at preserving biodiversity, increases by 50%.	<ul style="list-style-type: none"> ➤ Targeted attitude-shaping efforts aimed at preserving natural values under protection and of community importance, protected natural areas, as well as Natura 2000 sites. (<i>related objectives: 4.2, 4.3</i>) 	<ul style="list-style-type: none"> ➤ Number of participants in forest school activities (person p.a.) (<i>related objective: 4.3</i>)
4.5 1,500 schools participate in the Eco-School Network.	<ul style="list-style-type: none"> ➤ General attitude-shaping efforts (events, campaigns), publications and education tools aimed at preserving natural values under protection and of community importance, protected natural areas, as well as Natura 2000 sites. (<i>related objectives: 4.2, 4.4, 4.7</i>) 	<ul style="list-style-type: none"> ➤ Number of forest schools rated based on unified systems (<i>related objective: 4.3</i>)
4.6 At least one thousand kindergartens actively participate and receive a rating title in the Green Kindergartens Network.	<ul style="list-style-type: none"> ➤ Subsidy schemes supporting the usage and assets of a “forest school” service. (<i>related objectives: 4.3, 4.7</i>) 	<ul style="list-style-type: none"> ➤ Number of participants in general environmental protection events (<i>related objective: 4.4</i>)
4.7 Placing increased emphasis on the preservation of biodiversity in education.	<ul style="list-style-type: none"> ➤ Review and unification of the forest school rating system. (<i>related objective: 4.3</i>) 	<ul style="list-style-type: none"> ➤ Number of attitude-shaping environmental protection publications issued with a unified

	<ul style="list-style-type: none"> ➤ Increasing the number of events held by national park directorates aimed at the preservation of biodiversity. <i>(related objective: 4.4)</i> ➤ Qualitative development of communication on the Internet. <i>(related objectives: 4.1, 4.2, 4.3, 4.4)</i> ➤ Subsidy consultancy, training and monitoring in order to increase the number of eco-schools. <i>(related objective: 4.5)</i> ➤ In order to increase the number of Green Kindergartens, organising targeted subsidy application support workshops following the identification of the areas of Hungary where such facilities are absent; offering specific local consultancy and mentoring, and organising the dissemination of best practices through the conventional local kindergartens. <i>(related objective: 4.6)</i> 	<p>layout <i>(related objective: 4.4)</i></p> <ul style="list-style-type: none"> ➤ Number of schools that have received the title of an “eco-school” <i>(related objective: 4.5)</i> ➤ Number of kindergartens that have received the title of a “green kindergarten” <i>(related objective: 4.6)</i>
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Strategic area II: Maintaining and restoring landscape diversity, green infrastructure, and ecosystem services

Measurable objectives	Measures directly relating to the Objectives	Indicators
5. objective: Preserving landscape diversity and ecological landscape potential.		
5.1 The level of landscape diversity necessary for the long-term maintenance of biodiversity is assessed in 30% of the country.	<ul style="list-style-type: none"> ➤ Laying down the methodological foundations of a landscape classification system suitable for the assessment of landscape diversity; defining the main landscape types. <i>(related objective: 5.1)</i> ➤ Preparing a methodology for monitoring changes in landscape diversity and ecological landscape potential, and applying it in a sample area. <i>(related objective: 5.1)</i> ➤ Defining land usage requirements and maximum landscape burdens in sample areas, in order to preserve the ecological potential of landscape types. <i>(related objective: 5.1)</i> ➤ Promulgating a decree on landscape protection. <i>(related objective: 5.1)</i> ➤ Assessing specific landscape values that are significant from the perspective of biological and landscape diversity. <i>(related objective: 5.2)</i> 	<ul style="list-style-type: none"> ➤ Number of studies underlying a landscape classification system suitable for the assessment of landscape diversity <i>(related objective: 5.1)</i> ➤ Number of methodology studies underlying the monitoring of changes in landscape diversity and ecological landscape potential <i>(related objective: 5.1)</i> ➤ Number of newly identified specific landscape values <i>(related objective: 5.2)</i> ➤ Thematic map of the major landscape rehabilitation and reconstruction intervention types
5.2 The specific landscape values significant from the perspective of biological and landscape diversity are assessed in 50% of the country’s area.		
5.3 A nation-wide landscape rehabilitation and reconstruction target map and registry are prepared for the entire area of the country.		

	<ul style="list-style-type: none"> ➤ Defining complex landscape rehabilitation and reconstruction tasks relevant from the perspective of biological and landscape diversity. <i>(related objective: 5.3)</i> ➤ Preparing a nation-wide landscape rehabilitation and reconstruction target map and compiling a registry of the main intervention types and target areas. <i>(related objective: 5.3)</i> ➤ Landscape-scaled rehabilitation and reconstruction tasks are expressed in the relevant subsidy titles for the financial period 2014-2020. <i>(related objective: 5.3)</i> ➤ Launching complex sample projects in landscape rehabilitation and reconstruction. <i>(related objective: 5.3)</i> 	<ul style="list-style-type: none"> and target areas (number of items) <i>(related objective: 5.3)</i> ➤ Annual number of landscape-scaled rehabilitation and reconstruction projects <i>(related objective: 5.3)</i>
<p>6. objective: Coordinated development of green infrastructure elements in order to maintain and improve the functioning of natural systems and adapt to the effects of climate change, including the improvement of connections between areas of ecological and landscape ecological functions, as well as the reconstruction of potential area elements and degraded ecosystems.</p>		
<p>6.1 Degraded ecosystems of ecological functions as well as existing and potential green infrastructure elements are defined by 2020, at least 15% of them are restored, and the necessary policies and regulations are drafted and put in place.</p>	<ul style="list-style-type: none"> ➤ Laying down the policy foundations of a green infrastructure concept. <i>(related objectives: 6.1, 6.3)</i> ➤ Creating a spatial database describing the elements of Hungary's green infrastructure within and outside communities (definition of the territorial elements of green infrastructure, preparing a nation-wide map of green infrastructure, and compiling the registry of green infrastructure elements in Hungary). <i>(related objectives: 6.1, 6.3)</i> ➤ Working out methods and standards for the development of green infrastructure elements in Hungary; identification and restoration of target areas requiring urgent intervention. <i>(related objectives: 6.1, 6.3)</i> ➤ Integrating the aspects of preserving and developing the green infrastructure into Hungary's regulations (overview and coordination of the relevant regulations, defining the legal and regulatory system underlying green infrastructure development). <i>(related objectives: 6.1, 6.3)</i> 	<ul style="list-style-type: none"> ➤ Size of the assessed areas (hectares) ➤ Change in the size of restored and spontaneously regenerating areas (hectares) <i>(related objective: 6.1)</i> ➤ Number of built facilities decreasing the fragmentation of ecological systems (fish steps, animal crossing routes, tunnels for frogs). <i>(related objective: 6.2)</i> ➤ Length of above-the-ground cables (impeding the free movement of birds) replaced with underground cables or transformed in other ways (km) <i>(related objective: 6.2)</i> ➤ Territorial and qualitative change in the green infrastructure
<p>6.2 The fragmentation of the habitats of species under protection and of community importance most affected by habitat fragmentation and isolation decreases.</p>		
<p>6.3 The ratio of the green surface system constituting a part of the green infrastructure network, and the total size of the ecological</p>		

	<ul style="list-style-type: none"> ➤ Working out and implementing subsidy systems aimed at the identification, evaluation, as well as the qualitative and territorial development of green infrastructure. <i>(related objectives: 6.1, 6.2, 6.3)</i> ➤ Developing existing and potential green infrastructure elements; mitigating the adverse effects of climate change, and promoting adaptation to it. <i>(related objectives: 6.2, 6.3)</i> ➤ Improving the connections between natural and near-natural areas; establishment of ecological corridors and other connections; developments aimed at eliminating barriers to the free movement of species (animal crossing routes, tunnels for frogs, accessible sky, fish steps etc.) <i>(related objectives: 6.2, 6.3)</i> ➤ Above-the-ground power lines must be re-built in a bird-friendly manner pursuant to the commitment made in the Accessible Sky program; the construction and upgrade of guiding barriers and passageways at the most hazardous animal trails must continue; and the possibility of crossing rivers or traversing them longitudinally must be provided or improved. <i>(related objectives: 6.2)</i> ➤ Monitoring the effectiveness of investments related to the improvement of ecological relations. <i>(related objective: 6.2)</i> ➤ Planning and carrying out city ecology research aimed at developing green surfaces within towns and cities as part of the green infrastructure network <i>(related objective: 6.3)</i> ➤ Assessing green surfaces by determining green surface intensity index values <i>(related objective: 6.3)</i> ➤ Creating the system of government entities and authorities for the regulation and execution of works related to green surfaces within towns and cities; review of the licensing system related to green surfaces; review of the ecological and biological competences of stakeholders <i>(related objective: 6.3)</i> 	<p>network within towns and cities (hectares, green infrastructure intensity index) <i>(related objective: 6.3)</i></p> <ul style="list-style-type: none"> ➤ Total size of the ecological network (hectares) <i>(related objective: 6.3)</i>
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	<ul style="list-style-type: none"> ➤ Taking attitude-shaping measures aimed at developing and protecting green infrastructure (<i>related objectives: 6.1, 6.2, 6.3</i>) ➤ Reviewing the concept underlying the decree on the calculation of the biological activity value of an area. (<i>related objective: 6.3</i>) 	
<p>7. objective: Defining the value of ecosystems as well as tangible and intangible services that are indispensable to man, and integrating them into the comprehensive and thematic strategies aimed at the management of natural resources as well as into decision-making concerning local and national territory usage and territorial development.</p>		
<p>7.1 The sustainable management of ecosystems and their services is based on the ecological, biological and economic assessment of all ecosystem categories identified in Hungary.</p>	<ul style="list-style-type: none"> ➤ Preparing a spatial database describing the services of Hungary's ecosystem (working out a system of categories underlying the assessment of the country's ecosystem services; assessing and mapping those ecosystem services). (<i>related objective: 7.1</i>) 	<ul style="list-style-type: none"> ➤ Ratio of evaluated ecosystem categories (%) (<i>related objective: 7.1</i>)
<p>7.2 The assessment of ecosystem services as well as the aspects of their preservation and development are expressed in environmental resource management strategies, in the legal regulation of territory usage and territorial development, as well as in the planning of developments to be carried out in the 2014-2020 financial period.</p>	<ul style="list-style-type: none"> ➤ Repeated preparation of Hungary's Habitat Mapping Database, and identifying the country's natural capital index (<i>related objective: 7.1</i>) ➤ Evaluation of ecosystem elements and services based on indicators and economic considerations; definition of ecosystem service indicators (<i>related objective: 7.1</i>) ➤ Incorporating the economic definition of ecosystem services into impact assessment procedures and cost-benefit analyses. (<i>related objective: 7.1</i>) ➤ Integrating economic assessments into comprehensive and thematic strategies aimed at managing natural resources in decision-making about local and national territory usage and territorial development, in infrastructural development processes, and in subsidy schemes. (<i>related objective: 7.2</i>) ➤ Working out and implementing subsidy schemes and titles aimed at preserving and developing ecosystem services. (<i>related objective: 7.2</i>) ➤ Enforcing aspects related to the preservation and development of ecosystem services in infrastructural developments directly influencing the quality of those 	<ul style="list-style-type: none"> ➤ Ratio of targeted strategies prepared in view of the value of ecosystem services as well as aspects of their preservation and development (%) (<i>related objective: 7.2</i>) ➤ Ratio of development funds contributing to ecosystem service development to all development funds (%) (<i>related objective: 7.2</i>) ➤ Ratio of development funds spent in consideration of the value of ecosystem services and aspects of their preservation and development (%) (<i>related objective: 7.2</i>) ➤ Natural capital index (<i>related objective: 7.1</i>)

	<p>services. <i>(related objective: 7.2)</i></p> <ul style="list-style-type: none"> ➤ Evaluating ecosystem services, and enforcing the aspects of their preservation and development in the relevant subsidy titles and conditions in the 2014-2020 financial period. <i>(related objective: 7.2)</i> 	
<p>8. objective: Integrating aspects serving the preservation and development of biological and landscape diversity into comprehensive and relevant sectoral policies using the toolset of green infrastructure and ecosystem services, with special regard to territorial organisation.</p>		
8.1 Creating a system of legal, methodological and economic tools at the level of strategies and projects in order to enforce aspects aimed at the preservation and development of biological and landscape diversity.	<ul style="list-style-type: none"> ➤ Review of plans, strategies, and legal regulations affecting territorial processes; definition of the planning and regulation elements serving the preservation and development of biological and landscape diversity. <i>(related objective: 8.1)</i> 	<ul style="list-style-type: none"> ➤ Number of sample projects applying a landscape assessment methodology based on ecosystem services <i>(related objective: 8.1)</i> ➤ Share of schemes expressing the priority of brownfield investments in the 2014-2020 subsidy system (%) <i>(related objective: 8.2)</i>
8.2 The annual ratio of areas affected by greenfield investments decreases to 80% (or lower) of the 2013 value by 2020.	<ul style="list-style-type: none"> ➤ Working out the project-level horizontal toolset necessary for the preservation and development of biological and landscape diversity (e.g. preparing a research and subsidy system promoting the development of companies' ecological responsibility policies). <i>(related objective: 8.1)</i> 	<ul style="list-style-type: none"> ➤ Areas where former arable land has been re-classified and is used for another purpose (hectares p.a.) <i>(related objective: 8.2)</i> ➤ Area used for long-term forestry (hectares p.a.) <i>(related objective: 8.2)</i> ➤ Total area affected by greenfield investments (hectares p.a.) <i>(related objective: 8.2)</i> ➤ Re-using brownfield areas for agricultural or forestry purposes (hectares p.a.) <i>(related objective: 8.2)</i>
8.3 The regulation system for the community environmental protection program is supplemented with elements of the local biodiversity strategy.	<ul style="list-style-type: none"> ➤ Incorporating themes related to the preservation of biodiversity into the education and training system. <i>(related objective: 8.1)</i> ➤ Working out a landscape evaluation methodology aligned with planning processes and serving the preservation of biological and landscape diversity, based on ecosystem services, in order to select development objectives based on biodiversity; applying that methodology in sample projects. <i>(related objectives: 8.1, 8.2)</i> ➤ Following up on greenfield investments; working out a registration system for them. <i>(related objective: 8.2)</i> 	<ul style="list-style-type: none"> ➤ Investments carried out on

	<ul style="list-style-type: none"> ➤ Preparing a motivation system for re-using brownfield areas in agriculture or forestry. <i>(related objective: 8.2)</i> ➤ Preparing a comprehensive registry of unused brownfield areas and their potential utilisation. <i>(related objective: 8.2)</i> ➤ Introducing sanctions based on ecosystem service and/or green surface index values for greenfield investments. <i>(related objective: 8.2)</i> ➤ Preparing a motivation system in order to support brownfield investments and curb greenfield investments. <i>(related objective: 8.2)</i> ➤ Incorporating the priority of brownfield investments into the conditions of subsidy schemes in the 2014-2020 period. <i>(related objective: 8.2)</i> ➤ Working out a legal framework for local biodiversity as well as its content elements and implementation rules by supplementing the statutory system concerning the environmental programs of communities. <i>(related objective: 8.3)</i> 	<p>brownfield areas (hectares) <i>(related objective: 8.2)</i></p> <ul style="list-style-type: none"> ➤ Share of community environmental protection programs based on a local biodiversity strategy (%) <i>(related objective: 8.3)</i>
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Strategic area III: Increasing the role of agriculture in the conservation of biodiversity

Measurable Objectives	Measures directly relating to the Objectives	Indicators
9. objective: Preservation, development and sustainable use of genetic resources in our agriculture ; increasing the diversity of the genetic resources used in agriculture.		increasing the diversity of the genetic resources used
9.1 Increasing the number of accessions stored in plant gene banks by at least 20% for the long-term <i>ex situ</i> conservation of the genetic resources of plants .	<ul style="list-style-type: none"> ➤ Organising and carrying out collection trips in the Carpathian basin; seed exchanges. <i>(related objectives: 9.1, 9.3)</i> ➤ Promoting the registration of landraces; starting the registration of landraces stored in genebanks. <i>(related objective: 9.2)</i> 	<ul style="list-style-type: none"> ➤ Number of accessions safeguarded in plant gene bank collections. <i>(related objective: 9.1)</i>
9.2 For a more extensive usage, the number of registered landraces should reach 100		<ul style="list-style-type: none"> ➤ Number of accessions arrived in Hungary's gene banks via seed exchange <i>(related objective: 9.1)</i>
9.3 The number of items preserved in situ and, within that, with on farm methods should increase by 20%, with special regard to plant types that have long been cultivated in the	<ul style="list-style-type: none"> ➤ Promoting the preservation of cultivated plants by farmers (<i>on farm</i> conservation). <i>(related objective: 9.3)</i> ➤ Increasing general awareness of the value and importance of the genetic resources used in agriculture, and of the methods 	<ul style="list-style-type: none"> ➤ Number of registered landraces <i>(related objective: 9.2)</i> ➤ Number of accessions provided

Carpathian Basin.		
9.4 The number of items of indigenous tree species safeguarded in forestry gene banks should increase by at least 25%.	<ul style="list-style-type: none"> ➤ Developing <i>ex situ</i> forestry collections (gene banks), adding tree species indigenous in the Carpathian basin to them. (<i>related objective: 9.4</i>) 	<ul style="list-style-type: none"> ➤ by gene banks on farm (<i>related objective: 9.3</i>) ➤ Number of accessions of indigenous tree species safeguarded in forestry gene banks (<i>related objective: 9.4</i>)
9.5 Extending the <i>in situ</i> gene conservation program for tree species used in forestry; increasing the total area and number of <i>in situ</i> forestry gene reserves concerning at least 10 endangered tree species growing in homogenous and mixed forests.	<ul style="list-style-type: none"> ➤ Creating security duplicates of unique items in forestry gene banks. (<i>related objective: 9.4</i>) ➤ Continuing the establishment of an <i>in situ</i> forestry gene reserve network; selecting new gene reserves. (<i>related objective: 9.5</i>) 	
9.6 For the long-term conservation of animals' genetic resources, <i>in vitro</i> preservation of at least 30% of the gene bank accessions of valuable endangered, protected indigenous agricultural animal breeds.	<ul style="list-style-type: none"> ➤ Providing the institutional and financial background for the creation of a state-owned <i>in vitro</i> gene bank aimed at preserving animals bred by approved breeding organizations. (<i>related objective: 9.6</i>) ➤ Providing the institutional and financial background for the creation of state-owned <i>in vivo</i> (<i>in situ</i>) sites (nucleus breeding sites and sites for male animals kept for breeding) in order to preserve the nucleus stocks of protected indigenous and endangered agricultural animal breeds for the long term. (<i>related objective: 9.7</i>) 	<ul style="list-style-type: none"> ➤ Number of specimens and breeds preserved <i>in vitro</i> (<i>related objective: 9.6</i>) ➤ Number of agricultural animal breeds permanently lost (in five years) (<i>related objective: 9.7</i>)
9.7 For the long-term preservation of animal genetic resources for food and agriculture, lowering the final loss of livestock breeds, and <i>in situ</i> preservation of nuclei of valuable protected indigenous farm animals, at least 50% at state-maintained sites.	<ul style="list-style-type: none"> ➤ Continuing and extending the subsidies aimed at the 	<ul style="list-style-type: none"> ➤ Number of animals in preserved protected, indigenous nuclei stocks (per breed) (<i>related objective: 9.7</i>) ➤ Number of specimens and breeds

<p>9.8 Reaching the animal stock sizes necessary for the long-term and safe preservation of specific regional farm animals not yet recognised by the state, breeds that have long become indigenous, and recognised breeds of low specimen numbers.</p>	<p>preservation of protected indigenous and endangered agricultural animal breeds and genetic resources of micro-organisms from the European Agricultural and Rural Development Fund in the 2015-2020 period. <i>(related objectives: 9.1, 9.6, 9.7, 9.8)</i></p> <ul style="list-style-type: none"> ➤ Providing the institutional and financial background for the molecular genetic testing of long-indigenous agricultural animal breeds not yet officially recognized. <i>(related objective: 9.8)</i> ➤ Official recognition of the following breeds: Carpathian badger-coloured cattle; white “Racka” sheep of the Great Plains; yellow-headed sheep from Transylvania’s Kovászna county; and the Hungarian goose of Léva. <i>(related objective: 9.8)</i> ➤ Identification and genetic assessment of the agricultural animal breeds characteristic of each region; launching gene rescue programs; creating breeding organisations and nuclei of the identified breeds in state institutions. <i>(related objective: 9.8)</i> ➤ Initiating and implementing bilateral or multilateral cross-border professional programs aimed at rescuing the genes in the Carpathian Basin’s national livestock heritage. <i>(related objective: 9.8)</i> 	<p>preserved <i>in vivo</i>: (per breed) <i>(related objectives: 9.7, 9.8)</i></p> <ul style="list-style-type: none"> ➤ Number of male animals handed over for breeding (per annum and per breed) 9.7)
<p>10. objective: Promoting a varied, mosaic-patterned agriculture in view of the objective of preserving biological diversity as well as environmental and landscape protection, and the due utilisation of domestic and local biological foundations (and especially the varied animal and plant genetic resources in farming).</p>		
<p>10.1 Lowering the burden placed by plant cultivation on the environment.</p>	<ul style="list-style-type: none"> ➤ Reviewing the support policy tools that are detrimental to the preservation of agricultural biodiversity, and amending them as necessary. <i>(related objectives: 10.1, 10.2, 10.3)</i> ➤ Promoting environmentally friendly plant cultivation and protection practices. <i>(related objective: 10.1)</i> ➤ Integrated plant protection, i.e. replacing chemicals with agro-technical and biological processes as much as possible. <i>(related objective: 10.1)</i> ➤ Defining and disseminating information on habitat-specific 	<ul style="list-style-type: none"> ➤ Size of certified areas of ecological utilisation (hectares) <i>(related objective: 10.2)</i> ➤ Share of pastures and meadows used for animal husbandry (%) <i>(related objective: 10.3)</i> ➤ Share of areas cultivated via environmentally friendly mowing within the total mowed area (%)
<p>10.2 In order to promote environmentally friendly farming methods, increasing the total size of the areas under ecological farming pursuant to environmental and landscape protection considerations to 350,000 hectares.</p>		

<p>10.3 Stopping the decrease in the number of grazing animals; increasing the usage of meadows and pastures for animal husbandry by at least 10%.</p>	<p>multi-functional plant cultivation systems; presenting them to the public so that they are generally accepted; providing advice. <i>(related objective: 10.1)</i></p>	<p><i>(related objective: 10.3)</i></p> <ul style="list-style-type: none"> ➤ Number of grazing animals (per species – sheep, goats, cattle, horses) <i>(related objective: 10.3)</i>
<p>10.4 Sustainable utilisation of natural resources pursuant to the “greening program” within the Common Agricultural Policy.</p>	<ul style="list-style-type: none"> ➤ Focusing on measures aimed at maintaining soil fertility and soil life diversity. <i>(related objective: 10.1)</i> ➤ Education, training, and awareness-raising for the promotion of soil protection and sustainable soil usage. <i>(related objective: 10.1)</i> ➤ Promoting soil-protecting farming methods, preventing or mitigating soil degradation in order to protect biodiversity. <i>(related objective: 10.1)</i> ➤ Providing funding and incentives for environmentally friendly animal breeding and keeping practices, as well as farming based on best plant protection and growing practices. <i>(related objective: 10.2)</i> ➤ Announcing subsidies for experimental ecological farming. <i>(related objective: 10.2)</i> ➤ Extending ecological farming and plant cultivation options, including the research background, ecological breed improvement, plant protection alternatives, and environmental analysis. <i>10.2)</i> ➤ Promoting environmentally friendly mowing, and taking the measures required for that. <i>(related objective: 10.3)</i> ➤ When awarding agricultural subsidies under any title, giving additional points for environmentally friendly farming (ecological plant cultivation, outdoor animal husbandry etc.). <i>(related objective: 10.4)</i> ➤ When awarding agricultural subsidies under any title, giving additional points for growing at least three plant species on garden or plough-land plantations over 50 hectares but below 100 hectares, and for growing each additional new plant species for each 100 hectares of land over and above the first 100 hectares. <i>(related objective: 10.4)</i> ➤ Diversification of plant cultivation: parallel growing of several plough-land plants in order to spare the soil, pursuant 	<ul style="list-style-type: none"> ➤ Share of those farms larger than 50 hectares where at least three plant species are grown, and one new plant species is grown above each additional 100 hectare (%) <i>(related objective: 10.4)</i> ➤ Share of ecological target areas within the total cultivated area (size of ecologically farmed areas / size of total farming area) (%) <i>(related objective: 10.4)</i>

	<p>to the EU's "greening" program. (<i>related objective: 10.4</i>)</p> <ul style="list-style-type: none"> ➤ Prescribing obligations for the creation or maintenance of ecological target areas pursuant to the EU's "greening" program. (<i>related objective: 10.4</i>) ➤ Increasing the share of subsidies awarded in view of the preservation of natural resources and biodiversity when utilising agricultural and rural development funds between 2015 and 2020, compared to the 2007-2013 period. (<i>related objective: 10.4</i>) ➤ Continuing the agricultural and environmental management-related subsidy payments launched in 2007-2013; maintaining or increasing the area used for animal grazing. (<i>related objective: 10.3</i>) ➤ When utilising agricultural and rural development funds, ensuring the environmentally optimal ratio of land managed through grazing animals. (<i>related objective: 10.3</i>) ➤ Supporting experimental farming based on local or centrally supported initiatives, aiming to ensure satisfactory produce quality and yields but also the regeneration and maintenance of ecological systems. (<i>related objective: 10.4</i>) 	
<p>11. objective: By 2020, maximising the total area of land under sustainable farming via the diversity-related measures of the common agricultural policy (agricultural and environmental management payments, Natura 2000 compensation payments etc.), thus promoting to maintaining or increasing agricultural and, consequently, general biodiversity.</p>		
<p>11.1 The total area where land is used in view of the preservation of agricultural biodiversity (areas subsidised in targeted horizontal and zonal agricultural environment management programs as well as the Natura 2000 compensation program) increases to 1.2 million hectares.</p>	<ul style="list-style-type: none"> ➤ Maintaining and operating payment systems serving the preservation of agricultural biodiversity (<i>related objective: 11.1</i>) ➤ Increasing the total size of High Nature Value Farmlands (HNVF) supporting environmentally friendly farming practices, with special regard to Natural 2000 sites; upgrading the HNVF program; introducing voluntary commitments better suited to the local territorial characteristics and the habitat needs of the targeted species. (<i>related objective: 11.2</i>) ➤ Stopping the decrease in the area covered by grass; preserving the favourable natural conditions, primarily by 	<ul style="list-style-type: none"> ➤ Total size of the areas involved in agricultural environmental management programs (hectares) (<i>related objective: 11.1</i>) ➤ Total size HNVF areas receiving agricultural environmental management subsidies (hectares); their share compared to the total area used for agricultural in Hungary (%) (<i>related objective: 11.1</i>) ➤ Total size of the areas supported
<p>11.2 The total size of the areas involved in the agricultural environmental management program reaches two million hectares.</p>		
<p>11.3 The number of bustards (considered as an umbrella species) in Hungary reaches 1,700.</p>		

11.4 The index showing the change in the number of specimens of bird species characteristic of agricultural habitats stays constant (100).	supporting animal husbandry methods involving extensive grazing. <i>(related objective: 11.3)</i>	in targeted horizontal and zonal agricultural environmental management programs and the Natura 2000 grassland management program (hectares) <i>(related objective: 11.2)</i>
11.5 The decrease in the total size of grassland stops.	<ul style="list-style-type: none"> ➤ Creating, restoring or preserving green infrastructure elements related to agricultural areas; establishing a habitat structure better suited to protected species. <i>(related objective: 11.4)</i> ➤ In targeted agricultural environmental management programs, promoting the usage of species adapting to the characteristics (climate, soil and hydrology conditions) of the local region. <i>(related objective: 11.5)</i> 	<ul style="list-style-type: none"> ➤ Total size of HNMF areas (hectares) <i>(related objective: 11.2)</i> ➤ Total size of grassland (hectares) <i>(related objective: 11.3)</i> ➤ Total size of the areas supported in targeted agricultural environmental management programs and the Natura 2000 grassland management program (hectares) <i>(related objective: 11.3)</i> ➤ Number of bustards <i>(related objective: 11.3)</i> ➤ Index showing the change in the number of specimens of bird species characteristic of agricultural habitats <i>(related objective: 11.4)</i>

Strategic area IV: Sustainable forestry and wildlife management; protection and sustainable usage of water resources

Measurable Objectives	Measures directly relating to the Objectives	Indicators
12. objective: In order to preserve and increase biodiversity, further increasing the total size of forests managed via nature-friendly forestry methods; and effective enforcement of biodiversity considerations during the planning of the total forested area.		
12.1 Natura 2000 impact estimations have been performed for 80% of Natura 2000 sites.	<ul style="list-style-type: none"> ➤ Preparing impact estimations for Natura 2000 sites as part of district forest planning, and drafting the plans based on the results. <i>(related objective: 12.1)</i> ➤ Increasing the area of forests managed according to the selection and transformation forestry methods. <i>(related</i> 	<ul style="list-style-type: none"> ➤ Share of Natura 2000 forests for which Natura 2000 impact estimations are available (%) <i>(related objective: 12.1)</i>
12.2 The total size of forests managed according		<ul style="list-style-type: none"> ➤ Total area covered by forests

to methods ensuring continuous forest coverage (selection, transformation, and non-productive) exceeds 140,000 hectares.	<p><i>objective: 12.2)</i></p> <ul style="list-style-type: none"> ➤ Further coordination and development of policies and subsidies related to land usage in order to achieve the goal set for 2050 concerning forest coverage. ➤ Increasing the area covered by indigenous tree species by forest plantation and the transformation of forest structures. (<i>related objective: 12.3</i>) ➤ In Natura 2000 sites, increasing the quantity of deadwood that does not endanger the continued or improving health of the forest. (<i>related objective: 12.4</i>) ➤ Due regulation of the trade in and utilisation of forest tree species; thorough enforcement of the rules. (<i>related objective: 12.5</i>) 	managed according to the selection or transformation method, and non-productive forests (hectares) (<i>related objective: 12.2</i>)
12.3 The area covered by indigenous tree species increases by 5,000 hectares compared to 2013.		➤ Total area covered by indigenous tree species (hectares) (<i>related objective: 12.3</i>)
12.4 The quantity of deadwood that does not endanger the health of the forest increases.		➤ Number of legal regulations (forest plan decrees) promoting the quantity of deadwood
12.5 Forest tree species are utilised in a sustainable manner.		➤ Deadwood quantity (cubic metres) (<i>related objective: 12.4</i>)
➤ Protection situation of utilised forest tree species (<i>related objective: 12.5</i>)		
13. objective: In wildlife management , big game management does not endanger the renewal of biodiversity; the natural reproduction of small game starts, and endangered communities are rehabilitated.		
13.1 The number of big game decreases by 2020 and does not endanger biodiversity.	<ul style="list-style-type: none"> ➤ The legal tools for an effective decrease in the number of big game must be created, including the elimination of unnecessary limitations, the creation of opportunities to use game meat efficiently, and the establishment of an incentive system. (<i>related objective: 13.1</i>) ➤ Working out a subsidy system promoting a decrease in the size of cultivated fields and a 20% increase in border lengths. (<i>related objective: 13.2</i>) ➤ Regulating payments under the Common Agricultural Policy so that leaving field border plants intact should be in the interest of farmers. (<i>related objective: 13.2</i>) ➤ Decreasing the number of foxes. (<i>related objective: 13.2</i>) ➤ Researching the food base for small wild birds, with special regard to the role of invasive plants in diminishing insect populations. (<i>related objective: 13.2</i>) ➤ Considering the needs of waterfowls when designing and maintaining fishing lakes and water reservoirs used to 	➤ Total size of unfenced, naturally renewing forests (hectares) (<i>related objective: 13.1</i>)
13.2 The decrease in the number of small game, especially hares, partridges as well as nesting waterfowl that may be hunted stops by 2020, and there are viable populations of all species in Hungary.		➤ Total length of plough-land field borders (km) (<i>related objective: 13.2</i>)
		➤ Total size of the area covered by plants at the borders of fields (hectares) (<i>related objective: 13.2</i>)
		➤ Number of foxes per land unit (hectare) (<i>related objective: 13.2</i>)
		➤ Total size of reconstructed waterfowl habitats (hectares) (<i>related objective: 13.2</i>)
		➤ Total size of newly created waterfowl habitats (hectares)

	combat floods. <i>(related objective: 13.2)</i>	<i>(related objective: 13.2)</i>
14. objective: As part of the management of fish communities in natural waters, promoting the natural reproduction (and thus renewal) of fish, preserving endangered fish species in the wild, rehabilitation of endangered habitats, and especially protecting breeding and nesting places. Ensuring the possibility of crossing waters or traversing them longitudinally.		
14.1 Protection and rehabilitation of the habitats of fish and cyclostomes	<ul style="list-style-type: none"> ➤ In order to promote the breeding of indigenous fish species and thus preserve the diversity of natural fish fauna, restoring the morphological diversity of natural waters that have been strongly modified (separated from their shores). <i>(related objective: 14.1)</i> ➤ Rehabilitation of shorelines where fish breed. <i>(related objective: 14.1)</i> ➤ Rehabilitation and reconstruction of water and wet habitats. <i>(related objective: 14.1)</i> ➤ Designing and maintaining water reservoirs serving flood prevention in view of the natural breeding and nesting needs of fish. <i>(related objective: 14.1)</i> ➤ Providing the funding necessary to the production and placement of natural wild carp forms. <i>(related objective: 14.2)</i> ➤ Creating the conditions for fishing subordinated to the preservation of biodiversity, including shaping the attitudes 	<ul style="list-style-type: none"> ➤ Length of shorelines rehabilitated for fish breeding (km) <i>(related objective: 14.1)</i> ➤ Total size of the areas made more suitable for fish and cyclostomes (hectares) <i>(related objective: 14.1)</i> ➤ Total size of the areas newly created in flood water reservoirs as habitats for fish and cyclostomes (hectares) <i>(related objective: 14.1)</i> ➤ Size and share of habitats of satisfactory water quality (hectares) ➤ Ratio of natural carp forms placed out (%) <i>(related objective: 14.2)</i>

<p>14.2 There are stable and viable populations of all indigenous fish and cyclostome species in the country. The areas populated by various species do not decrease; the areas populated by species living in swampy habitats increase.</p>	<p>of fishermen. <i>(related objective: 14.2)</i></p> <ul style="list-style-type: none"> ➤ By planning fish farming according to novel aspects, preservation and management of indigenous fish communities, improving their composition in order to maintain close-to-natural conditions and enforce environmental protection aspects. <i>(related objective: 14.2)</i> ➤ Working out methods for the artificial breeding of economically insignificant but naturally valuable, rare or endangered fish species so that they can be reinstated in their previous habitats. <i>(related objective: 14.2)</i> 	<ul style="list-style-type: none"> ➤ Total size of the habitats where fishing is managed according to the relevant measure (hectares) <i>(related objective: 14.2)</i> ➤ Total size of habitats satisfactorily managed in terms of fish breeding plans and their implementation (hectares) <i>14.2)</i> ➤ Number of specimens artificially bred and placed out; total size of newly populated areas (hectares). <i>(related objective: 14.2)</i>
<p>15. objective: Identifying the role of waters in watery and water-dependent on-land ecosystems; dissemination and coordination of water management as well as logical and frugal water consumption; decreasing water pollution in order to preserve biodiversity and maintain the ecosystem services of micro- and macro-level life forms dependent on water.</p>		
<p>15.1 Protection of surface and sub-surface waters on land, pursuant to the Water Directive Framework. Achieving the “good state” by 2015, and further measures by 2020 for the protection or improvement of water-related ecosystems (i.e. land ecosystems that directly depend on water or on watery ecosystems).</p>	<ul style="list-style-type: none"> ➤ Implementation and effective follow-up of territorial water management plans. Via the planning of water catchment area management efforts, extending the general objectives of the Water Directive Framework to watery habitats smaller than the designated water bodies (ex lege salty lakes, swamps). <i>(related objectives: 15.1, 15.2)</i> ➤ Lowering the pollution of surface waters, including diffuse pollution by agriculture. <i>(related objective: 15.1)</i> ➤ Reconstruction of watery habitats. <i>(related objective: 13.2)</i> ➤ Improving water management in water and wet habitats 	<ul style="list-style-type: none"> ➤ Ratio of water bodies of good ecological condition according to the national water catchment area management plan (%) <i>(related objectives: 15.1, 15.2, 15.3)</i> ➤ Number of completed river branch rehabilitation projects <i>(related objectives: 15.1, 15.2, 15.5)</i> ➤ Number of eliminated river
<p>15.2 Harmonising territorial development and area management goals and principles, as well as objectives important for the biodiversity of</p>	<ul style="list-style-type: none"> ➤ Improving water management in water and wet habitats 	<ul style="list-style-type: none"> ➤ Number of eliminated river

waters.	(such as the flood-plain of rivers) as well as the possibility to cross them or traverse them longitudinally. (<i>related objectives: 15.3, 15.5</i>)	branch blocks (<i>related objectives: 15.1, 15.2, 15.5</i>)
15.3 Preventing the deterioration of the state of surface and sub-surface waters so that the communities of creatures living in waters and land creatures depending on water can adequately react to external loads.	➤ Preserving watery habitats of international significance (Ramsari sites) and developing them as necessary; monitoring and wisely using them. (<i>related objectives: 15.3, 15.4</i>)	➤ Number of constructed objects modernised in view of ecological considerations (<i>related objective: 15.1, 15.2, 15.5</i>)
15.4 By 2020, creating healthy water ecosystems that can offer adequate services for the system, biodiversity, and well-being.	➤ Preparing and implementing an action plan for the elimination of factors endangering subsurface waters and springs. (<i>related objectives: 15.1, 15.3</i>)	➤ Share of river sections that can be crossed or traversed longitudinally (%) (<i>related objective: 15.5</i>)
15.5 Longitudinal and cross-wise traversability improves at 15% of river branch systems or more.	➤ Working out and implementing an alluvium management and planning system in order to improve alluvium conditions in large rivers and decrease the tendency of riverbed sinking. (<i>related objectives: 15.5, 15.6</i>)	➤ Number of measures taken in order to mitigate the sinking of the riverbed of the Danube (<i>related objective: 15.6</i>)
15.6 The alluvium balance of the Danube is prepared as a basis for measures aimed at mitigating riverbed sinking.		

Strategic area V: Fighting invasive non-indigenous species

Measurable Objectives	Measures directly relating to the Objectives	Indicators
16. objective: Curbing the communities of invasive non-indigenous species that harm the natural or near-natural ecosystem; preventing potentially dangerous invasive species from entering and settling in Hungary.		
16.1 The fight against the currently most dangerous invasive species damaging natural and near-natural ecosystems and the efforts at preventing their further spreading are based on a framework system of rules and measures defined according to the European Union's regulations.	<ul style="list-style-type: none"> ➤ Adopting the Union's directive for protection from invasive species into Hungary's legal system. (<i>related objective: 16.1</i>) ➤ Implementation of the EU Parliament's and the Council's regulation on preventing the settlement or entry and spreading of non-indigenous invasive species. (<i>related objective: 16.1</i>) 	<ul style="list-style-type: none"> ➤ Number of invasive non-indigenous species of known spreading routes for which action plans have been worked out. (<i>related objectives: 15.2, 16.1</i>) ➤ Number of newly appeared invasive non-indigenous species posing a potential threat to environmental protection (<i>related objectives: 16.1, 16.3</i>)
16.2 Interventions are made and actions are taken against the proliferation of invasive non-indigenous plant species on at least 10% of Natura 2000 sites (including geographically overlapping other protected areas).	<ul style="list-style-type: none"> ➤ Defining the main fields of action aimed at curbing invasive non-indigenous species (such as trade and agriculture), reviewing the current regulations relevant to them, and identifying the needs and opportunities for amendment. (<i>related objectives: 16.1, 16.3</i>) 	<ul style="list-style-type: none"> ➤ Number of invasive non-indigenous species of known

<p>16.3 Preventing the settlement of new invasive non-indigenous species posing a potential threat to environmental protection in Hungary; setting up the required framework of regulations and measures.</p>	<ul style="list-style-type: none"> ➤ Working out regulations for potentially dangerous invasive non-indigenous species in line with the European Union’s regulations; setting up a monitoring system. <i>(related objective: 16.3)</i> ➤ Working out an early identification and risk analysis system, including the examination of invasiveness of newly settling species. <i>(related objective: 16.3)</i> ➤ Compiling and announcing the list of potentially dangerous invasive non-indigenous species. <i>(related objective: 16.3)</i> ➤ Identifying the potential and actual routes through which invasive non-indigenous species spread. <i>(related objectives: 16.1, 16.3)</i> ➤ Working out species-level action plans to curb invasive non-indigenous species posing a potential and actual threat to environmental protection. <i>(related objectives: 16.1, 16.3)</i> ➤ Targeted interventions aimed at curbing invasive non-indigenous species, primarily in protected areas and Natura 2000 sites. <i>(related objective: 16.2)</i> ➤ Nation-wide awareness-raising and attitude-shaping about the problems caused by invasive non-indigenous species. <i>(related objectives: 16.1, 16.3)</i> ➤ Developing the infrastructural background (machines, tools etc.) necessary to curb invasive non-indigenous species damaging protected natural values and Natura 2000 sites. <i>(related objectives: 16.2, 16.3)</i> ➤ Promoting the realisation of objectives related to curbing as well as preventing the settlement and spread of both existing and new, potentially dangerous invasive non-indigenous species in the relevant subsidy schemes (e.g. agricultural, forestry and fishery subsidies) in the 2014-2020 financial period. <i>(related objective: 16.2)</i> 	<p>potential spreading routes for which preventive action plans have been worked out. <i>(related objectives: 16.1, 16.3)</i></p> <ul style="list-style-type: none"> ➤ Share of protected areas and Natura 2000 sites cleaned of invasive non-indigenous species (%) <i>(related objective: 16.2)</i> ➤ Share of the development funds spent in view of the goal of curbing as well as preventing the settlement and spread of both existing and new, potentially dangerous invasive non-indigenous species in percentage of the relevant development funds <i>(related objective: 16.3)</i> ➤ Quantity of non-indigenous fish caught (tons p.a.) <i>(related objective: 16.1)</i>
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Strategic area VI: Increasing Hungary’s contribution to halting the world-wide loss of biodiversity; meeting the obligations arising from biodiversity-conservation related agreements

Measurable Objectives	Actions	Indicators
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17. objective: Applying the principle of due care when emitting genetically modified organisms into the environment, in order to prevent any negative impact on biodiversity.		
17.1 No GMO farming is performed in Hungary; biodiversity is not threatened by the release of GMOs into the environment.	<ul style="list-style-type: none"> ➤ Introduction of safeguard clause procedures and/or urgency measures for GMOs that have harmful effects and the production of which is permitted in the European Union. <i>(related objective: 17.1)</i> ➤ Preparing a study of the social, economic and environmental reasons for banning the production of GMOs in general, a group of GMOs, or individual GMOs on a case-by-case basis (such as preserving environmental and landscape characteristics, habitats and ecosystems, as well as specific ecosystem functions and services). <i>(related objective: 17.1)</i> ➤ Active monitoring and testing of GMO contamination in plough-land located close to Hungary's borders. <i>(related objective: 17.1)</i> ➤ Contacting neighbouring countries and concluding diplomatic treaties with them in order to keep the areas close to Hungary's borders GMO-free. <i>(related objective: 17.1)</i> ➤ Active monitoring of gene technology-related activities. <i>(related objective: 17.1)</i> ➤ Providing the technical requirements and funding for environmental and health impact studies in Hungary concerning GMOs currently undergoing authorization procedure in the EU. <i>(related objective: 17.2)</i> 	<ul style="list-style-type: none"> ➤ Total area of GMO-free farming (hectares) <i>(related objective: 17.1)</i> ➤ Number of independent impact studies in Hungary <i>(related objective: 17.2)</i>
17.2 Increasing the number of independent impact studies in Hungary.		
18. objective: Protecting animal and plant species threatened by trade		
18.1 International trade does not endanger any wild population of species subject to the Washington treaty (CITES) in Hungary.	<ul style="list-style-type: none"> ➤ Assessing Hungary's wild populations of commercially utilised species subject to CITES; limiting the quantity to be utilised. <i>(related objective: 18.1)</i> ➤ Strengthening checks within the country, in addition to border checks. <i>(related objective: 18.2)</i> ➤ Regular training for officers of the authorities responsible for the implementation of CITES. <i>(related objective: 18.2)</i> ➤ Providing wide-ranging information to society about the effect of the trade in endangered species on decreasing biodiversity. <i>(related objectives: 18.1, 18.2)</i> 	<ul style="list-style-type: none"> ➤ Ratio of non-detriment findings for utilised species with wild populations in Hungary, aimed at sustainable utilisation (%) <i>(related objective: 18.1)</i> ➤ Ratio of checks performed, and within that, of identified illegal acts (%) <i>(related objective: 18.2)</i>
18.2 Increasing the share of legally compliant behaviour in the trade in endangered species.		

19. objective: Ensuring access to genetic resources as well as the just and fair sharing of the benefits resulting from their utilisation , thus promoting comprehensive compliance with the Nagoya Protocol as soon as possible.		
19.1 Access to Hungary's genetic resources is legally adequately regulated, without endangering the country's biodiversity.	<ul style="list-style-type: none"> ➤ Assigning a national focal point and a competent national authority concerning access to genetic resources and the sharing of the resulting benefits; creating a website to disseminate information. (<i>related objectives: 19.1, 19.2</i>) ➤ Working out clear regulations concerning access to and the utilisation of Hungary's genetic resources by the end of 2015, in view of the goal of preserving biodiversity. (<i>related objective: 19.1</i>) ➤ Adopting the Nagoya Protocol and Regulation 511/2014 by the European Parliament and Council in domestic practices, with the involvement of stakeholders. (<i>related objectives: 19.1, 19.2</i>) ➤ Notifying stakeholders of the obligations arising from the Nagoya Protocol. (<i>related objectives: 19.1, 19.2</i>) 	<ul style="list-style-type: none"> ➤ Number of accesses to Hungary's genetic resources (p. a.) (<i>related objective: 19.1</i>) ➤ Number of procedures launched against Hungarian users who have gained unauthorised access to genetic resources (p. a.) (<i>related objective: 19.2</i>)
19.2 Hungarian users of genetic resources obtain genetic resources in all countries of the world legally, pursuant to the Nagoya Protocol and the regulations of the relevant countries.		
20. objective: Increased emphasis on preserving biodiversity in Hungary's international activities, including the provision of funds to developing countries.		
20.1 Increasing emphasis on aspects of biodiversity preservation in Hungary's international development cooperation efforts.	<ul style="list-style-type: none"> ➤ Incorporating aspects and activities of biodiversity protection into projects carried out within international development cooperation efforts. (<i>related objectives: 20.1, 20.2</i>) 	<ul style="list-style-type: none"> ➤ Number of projects financed by Hungary and including activities related to biodiversity protection (<i>related objectives: 20.1, 20.2</i>) ➤ Funding available for projects supported by Hungary and complying with biodiversity preservation aspects (EUR) (<i>related objectives: 20.1, 20.2</i>)
20.2 Increased emphasis on biodiversity preservation aspects in aid loan projects to be concluded in future.		

4 TOOLS AND INSTITUTIONS SERVING THE REALISATION OF STRATEGIC OBJECTIVES

The following factors play an important role in the realisation of the strategy: providing the required funding; creating a supporting regulatory environment that promotes the preservation of biodiversity; and support at legal and administrative levels. The strategy does not result in direct legislative obligations, but the objectives must be supported by the legislative process. The strategy can only be executed if biodiversity preservation aspects and the strategic objectives are taken into consideration when taking future legislative and sectoral actions.

4.1 Financial tools: funding sources available for the realisation of the strategic goals

It is a basic requirement that the funds provided by international organisations, the European Union and the national budget for environmental and natural protection, agricultural and rural development, water management and infrastructural developments should be utilised in view and in support of the objectives defined in the National Biodiversity Strategy.

The following table (table 5) lists the funding sources available for the realisation of the objectives.

FINANCIAL TOOLSET: FUNDING SOURCES AVAILABLE FOR THE IMPLEMENTATION OF THE NATIONAL BIODIVERSITY STRATEGY									
Funding types:	Specific Hungarian funds ³¹	EU funds						Other (e.g. international or private sector) funds	Remark
Objectives		ERDF/	EASRD	EMFF	LIFE	Horizon 2020	R&D		
1. State of territories; environmental management		x	x	x	x				
2. Environmental protection state of species		x	x	x	x				
3. Knowledge base development	x*	x					x		*Green Funds subsidy scheme
4. Information and attitude-shaping related to biodiversity	x*	x**							*Green Funds subsidy scheme ** EEOP, EDIOP
5. Preservation of landscape diversity and ecological landscape potential	x*	x		x	x			x	*Green Funds subsidy scheme
6. Maintenance and development of green infrastructure		x	x	x	x				
7. Ecosystem services		x			x		x		

³¹ Specific Hungarian funds include concrete sources available for the realisation of any action within the objective (e.g. chapter-managed budget allocation).

8. Integration of aspects aimed at the preservation and development of biological and landscape diversity							x	x	
9. Preservation of the genetic resources underlying Hungary's agriculture	x*			x			x	x	*Chapter-managed budget allocation for the state's gene preservation tasks; budget allocation for gene preservation institutions
10. Varied, mosaic-patterned agriculture	x*			x				x**	* Agricultural research subsidy, **Agricultural market players
11. Common Agricultural Policy measures related to biodiversity				x*					*Agricultural environmental management subsidies, Natura 2000 compensation payments, subsidies for non-productive investments
12. Silviculture				x*				x**	*EMFF Forest environmental protection payments, subsidies for forest plantation and forest structure transformation, ** contribution by forest managers
13. Wildlife management	x*								* Title group "subsidies for wildlife management"
14. Fishery management	x*			x					* Subsidies for fishery management tasks of the state (<i>expected to be available over the entire planning period</i>)
15. Water management		x		x				x*	* contribution by land owners and users
16. Curbing invasive non-indigenous species		x	x		x				
17. Genetically modified organisms								x*	* research subsidies (e.g. Basic Programs for National Scientific

									Research)
18. Protection of species endangered by trade									
19. Access to genetic resources and just sharing of the gains resulting from their usage									
20. Enforcing aspects of biodiversity when providing international funds									

Table 5.: Funding sources available for the execution of the National Biodiversity Strategy (2013)

4.2 Institutional toolset: actors involved in the realisation of strategic objectives

In addition to government, scientific and education institutions, wide-ranging social involvement is also indispensable to the realisation of the strategic objectives. The following is a presentation of the main actors involved in each objective.

Actors involved	Number of objective																				Remark
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
MINISTRIES																					
Ministry of Agriculture	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Ministry of Internal Affairs						x	x	x							x						
Ministry of Human Resources				x				x													
Defence Ministry																					
Justice Ministry																					
Ministry of Foreign Affairs and Trade																		x		x	
Ministry of National Economy	x					x	x	x												x	
National Development Ministry	x			x		x	x	x												x	
Prime Minister's Office	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x					
CENTRAL AND REGIONAL ADMINISTRATIVE ENTITIES																					
national park directorates	x	x	x	x	x	x	x		x			x		x	x	x	x				
Agricultural and Rural Development Office												x	x								
National Food Chain Safety Authority									x			x	x	x		x	x	x			
water management directorates	x	x				x	x						x	x	x	x					
environmental and natural protection authorities	x											x		x	x				x		
National Tax and Customs Administration																			x		
Police																			x		

Zöldségtermesztési Kutató Intézet Zrt.									x												
private farmers	x	x				x	x		x			x	x	x		x					
EDUCATION AND RESEARCH INSTITUTIONS																					
higher education institutions	x		x	x	x	x	x	x	x		x					x		x	x		
Education Research and Development Institute				x																	
Hungarian Academy of Sciences, and its background institutions	x		x		x	x	x	x	x	x	x					x			x		
viticulture and wine production research institutes (Badacsony, Eger, Kecske-mét, Pécs, Tokaj)									x												
public collections, gardens with collections	x	x	x	x		x										x		x	x		
NON-GOVERNMENTAL ORGANISATIONS, ASSOCIATIONS, FEDERATIONS																					
Environmental NGOs	x	x	x	x	x	x	x	x	x		x					x	x	x			
Association for the Management of Tourism Destinations in Hungary				x																	
Chamber of Hungarian National Agricultural Management										x											
Persons authorised to hunt												x	x								
Persons authorised to catch fish														x							
Association of Hungarian Animal Breeders									x	x											
Association of Hungarian Aquaculture																x					
Association of Hungarian Fish Producers and Fishing Water Users															x						
Association of Hungarian Arboreal and Botanical Gardens	x		x	x												x		x	x		
Association of Zoos in Hungary				x												x		x			

Table 6.: Actors involved in the realisation of the objectives of the National Biodiversity Strategy (2013)

5 FOLLOWING UP ON THE IMPLEMENTATION OF THE STRATEGY

For the realisation of the vision valid until 2020, it is of paramount importance that the execution of the National Biodiversity Strategy should start immediately.

It is primarily the government that will provide the institutional and personnel requirements for the required interventions, by sharing the work amongst ministries. The Government will manage the execution of state tasks related to the preservation of biodiversity, as well as define and coordinate the related activities of ministries and other organisations directly reporting to the Government. But if the objectives are to be achieved, it is crucial to involve all social stakeholders – and specifically local municipalities, the economic sector, and residents – in the work.

The personnel necessary for the realisation of the Strategy is mostly available. In order to execute the Strategy, ensure continuous follow-up, and provide the information bases necessary for evaluation, the following factors are vital: satisfactory cooperation with the government's policy institutions; strengthening the base of experts in background institutions of ministries; and closer connections with experts. Providing the personnel required for the Strategy is closely related to the Magyar Zoltán Public Administration Development Program.

The execution of the Strategy, the effectiveness of the objectives and measures, and the related professional performances must be continuously evaluated, and the adequacy of the measures must be reviewed as necessary. The realisation of the Strategy will be followed up via indicators defined for each objective, which necessitates data and information collection as well as analysis.

An **interim evaluation** of the realisation of the Strategy must be prepared **in 2017**, to be followed by **retroactive evaluation in 2021**, within one year from the end of the execution period.

These reports must be published on the Hungarian home page of the Biodiversity Treaty (<http://www.biodiv.hu/>).

The personnel required for the evaluation and follow-up of execution is provided by the Ministry responsible for environmental protection, in cooperation with other affected ministries and institutions.

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