THE FIFTH NATIONAL REPORT TO THE UNITED NATIONS CONVENTION ON BIOLOGICAL DIVERSITY

Republic of Serbia
MINISTRY OF AGRICULTURE
AND ENVIRONMENTAL PROTECTION

CONTENT

ABBREVIATIONS

BDEA	Biodiversity Enabling Activities
CARDS	Community Assistance for Reconstruction, Development and Stabilization – European Union financial support for West Balkans
CBD	Convention on Biological Diversity
COP	Conference of Parties
CORINE	Coordination of Information on the Environment
ECNC	European Center for Nature Conservation
EEA	European Environmental Agency
ES	Ecosystem Services
ESP	Ecosystem Services Partnership
EUNIS	European Nature Information System
GEF	Global Environment Fund
EWEA	European Wind Energy Association
GEF	Global Environment Facility
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
IBA	Important Bird Area
IPA	Important Plant Area
IUCN	International Union for Conservation of Nature
LBAP	Local Biodiversity Action Plan
MAB	"Man and Biosphere"
MAES	Mapping and Assessing of Ecosystem Services
NAPS	Association of National Parks and Protected Areas of Serbia
NGO	Non-governmental organization
NP	National park
OECD	The Organization for Economic Co-operation and Development
PA	Protected Area
PA BAT	Protected Areas Benefit Assessment Tool
PBA	Prime Butterfly Areas
REC	Regional Environmental Center
SCI	Sites of Community Importance
SDC	Swiss Agency for Development and Cooperation
SEE	South-Eastern Europe
SESP	Serbian Ecosystem Services Partnership
SNR	Special Nature Reserve
SPA	Special Protection Area
UNDP	United Nations Development Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
WTP	Willingness To Pay

EXECUTIVE SUMMARY

General notes

The fifth national report to the United Nations Convention on Biological Diversity has been prepared within the project " National Biodiversity Planning to Support the implementation of the CBD 2011-2020 Strategic Plan in the Republic of Serbia", which is financed by the Global Environment Facility(GEF) and implemented in partnership with the UNDP and the Ministry of Agriculture and Environmental Protection. The process of data collection and organization of meetings with the stakeholders for the purpose of elaboration of the report was by the Institute for Nature Conservation of the Republic of Serbia. The data presented in the report primarily relate to the period from 2011–2013, unless otherwise stated.

The report comprises the following parts:

1. BIODIVERSITY IN SERBIA – STATUS, TRENDS AND THREATS; SIGNIFICANCE OF BIODIVERSITY FOR THE HUMAN WELL-BEING
2. IMPLEMENTATION OF THE NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN AND INTEGRATION OF BIODIVERSITY INTO OTHER SECTORS
3. PROGRESS TOWARDS THE 2015 AND 2020 AICHI TARGETS AND CONTRIBUTION TO THE RELEVANT 2015 MILLENNIUM DEVELOPMENT GOALS

PART I

Serbia, as one of the countries in the region of Central and East Europe, within the UN system, covers an area of 88,461 km^2, which represents about 2% of the European continent. Serbia, with its rich natural and cultural heritage, represents one of important centres of biological and geological diversity in Europe, where almost all zonal types of climate, land and biomes of Europe alternate.

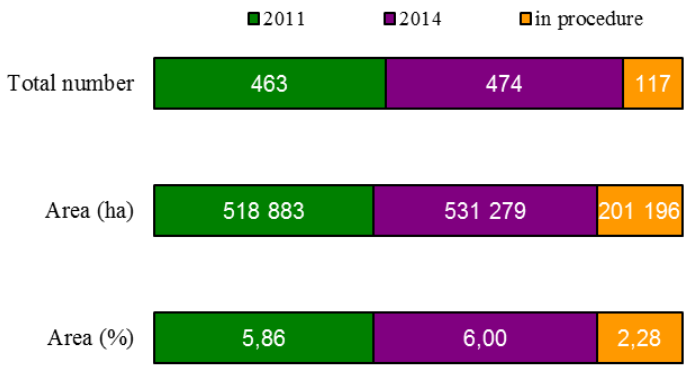
Eight basic types of habitats have been identified in Serbia, according to the EUNIS habitat classification. The diversity of the ecosystems in Serbia is reflected in the diversity and specific character of vegetation: 1,339 associations and 59 vegetation classes have been registered in the territory of Serbia. The most important centres of ecosystem diversity in Serbia with a large number of endemic, relict and endemic-relict communities are: high mountain regions (Kopaonik, Tara, Šarplanina, Prokletije, Stara planina and Suva planina), sand and steppe habitats (Deliblato and Subotica-Horgoš sands and mosaic salty areas in Banat and Bačka, in Vojvodina) and refugial areas (the Đerdap gorge, the canyon of the Drina River, the Sićevaćka gorge, the valley of the Pčinja River). Ten basic types of zonal ecosystems are present in Serbia, of which continental aquatic ecosystems, specific isolated continental (terrain) ecosystems, and continental naturally unstable ecosystems influenced by natural and induced successions, forest climate-genetic ecosystems, subterranean ecosystems, are especially sensitive to endangering factors.

The pressures which have been influencing the biodiversity in Serbia during the last 3-4 years are:

- fires in protected areas which have impacted forest ecosystems and led to changes in biogeocenotic balance;
- influence of agricultural production – exaggerated application of artificial fertilizers and pesticides, uncontrolled drainage of liquid manure from cattle farms, land management in steppe and salty water habitats and diffuse pollution on agricultural fields;
- construction of hydro electric power plants;
- intensive exploitation of sand and gravel from the river bed, which changes its morphologic and hydrologic characteristics, causes destruction of the flooding zone vegetation, decreases shores stability and increases risk from flooding during periods of high water levels;
- regulation of rivers and flood prevention measures, due to interruption of connections between rivers and flooding areas along river beds and drainage of these areas;
- the protection of agricultural land from internal waters, as well as drainage of wet meadows and pastures with the aim of increasing the surface of arable land, which endangers natural habitats that represent a priority for protection, as well as the species connected to them.

The protection of biodiversity in Serbia is realized through the implementation of measures for the protection and improvement of species, their populations, natural habitats and ecosystems and it has been regulated by the Law on Nature Conservation ("The Official Gazette of the Republic of Serbia", No. 36/2009, 88/2010 and 91/2010-correction), as the framework law. The number of protected areas in Serbia is 474. The total protected surface is 531,279 hectares, which represents 6% of the total territory of the country. According to the Spatial Plan of the Republic of Serbia ("The Official Gazette of the Republic of Serbia", No. 88/10) by 2015, about 10% of the Serbian territory should be protected, i.e. 12% by 2021. In relation to the data presented in the Fourth National Report, the number of the protected areas has increased (11 new areas have been designated in the period since 2011), as well as the total protected surface in the percentage of 0.14%. There are additional 117 areas in the protection procedure, which represents a surface of 2.28% of the territory of Serbia.

Figure I - Protected areas and areas in protection procedure in Serbia: number, total surface in hectares and percentage of protected territory (comparison of the state in 2011 and 2014)



The Decree on Ecological Network ("The Official Gazette of the Republic of Serbia", No. 102/2010) determined the manner of protection, management and financing of ecological network, i.e. areas of ecological importance and ecological corridors of national and international importance, including Emerald and Natura 2000. This Decree includes 101 areas of ecological importance, as well as ecological corridors of international importance.

Protected areas and areas in protection procedure in Serbia: number, total surface in hectares and percentage of protected territory (comparison of the state in 2011 and 2014)

Map I - The Ecological Network of Serbia. Source: Institute for Nature Protection of the Republic of Serbia, 2014

Serbia has a number of internationally important sites for conservation of biodiversity. Ten areas have been recognized and included into the list of **wetlands of international importance (Ramsar areas)**, and they cover a surface of 63,919 hectares, which is equivalent to 0.72% of the territory of Serbia. Within the UNESCO program "Man and Biosphere" (MAB) in 2001, Nature park 'Golija' was declared, together with the surroundings of Studenica Monastery, as a **biosphere reserve** 'Golija – Studenica'. In 2013, the nomination for the Serbian part of the future cross-border biosphere reserve 'Mura – Drava – Danube' was prepared and delivered.

Up to now, Serbia has proposed 61 sites to be nominated for **Emerald pan-European ecological network**. Other areas of international importance in Serbia. are 42 **Important Bird Areas (IBA)** have been defined, as well as 62 **Important Plant Areas (IPA)** and 40 **Prime Butterfly Areas (PBA).**

Currently, **1,760** wild species of plants, animals and fungi are strictly protected and **853** are protected by law. Protection of Species is regulated by Rulebook on the proclamation and protection of strictly protected and protected wild species of plants, animals and fungi ("The Official Gazette of the Republic of Serbia", No. 5/2010 and 47/2011). A special form of protection relates to the species that can be endangered due to exaggerated and uncontrolled collection from nature. In comparison with the Fourth national report, changes occurred in 2011 and 15 species were removed from the list of the species which can be collected and used for commercial purposes. Currently, controlled use is allowed for **97** species. Among

them there are **63** plant species (**2** fern species and **61** seed bearer species), **15** fungi species and **9** animal species (2 reptile species, 3 amphibian species and 4 invertebrate species).

The researches on ecosystem services in Serbia are in the initial phase. The term itself has not been clarified enough and accepted in the wider public, and more detailed analyses of ecosystem services have not been performed yet. However, some activities have been realized. The first steps in the evaluation of ecosystem services in Serbia were performed by the end of nineties in the past century by the Institute of Economic Sciences, when the preliminary analyses and one study related to the evaluation of ecosystem services were performed. In 2013, the Institute of Economic Sciences issued a publication which originated as a result of the research related to the utilization and management of natural resources, values and protected areas in Serbia, based on the example of a selected group of Special Nature Reserves (Drašković, 2013). The Initiative "Local Biodiversity Action Planning for Southeastern Europe" and the implementation of the Project "Biodiversity and ecosystem services for local sustainable development in the Western Balkans", which are actually based on the concept of ecosystem services were realized in the period from 2009–2013. They were implemented through partnership between international organization European Centre for Nature Conservation, Regional Environment Centre and local authorities of 18 municipalities in the region of Southeast Europe. The inclusion of Serbia into the Global Partnership for Ecosystem Services was initiated in 2013 (the Serbian Ecosystem Services Partnership (SESP) - http://www.es-partnership.org/esp/80133/5/0/50), and the establishment of research of ecosystem services in Serbia is implied. The goal of this partnership is Mapping and Assessment of Ecosystems and their Services (MAES). At the beginning of 2014, the Institute for Nature Conservation of the Republic of Serbia started the activities related to defining and evaluation of ecosystem services at the Djerdap National Park.

In the Fifth National Report, the analysis of the statistical data related to the changes and trends in the past five years (2008–2012) and it is focused on the basic natural resource systems in Serbia – land, agricultural and forest resources. For the presentation of the resource capacities in Serbia, in relation to the population size, this Report has used the data obtained from the census and the data taken from Annual Statistical Reports of the Serbian Statistical Institute. The basic analysis of the natural resources which influence the human well-being in Serbia has been presented through the utilization of the principle presented in the Environmental Indicator Report 2013 of the European Environment Agency.

At the moment, the only system which exists in Serbia and deals with the collection of fees for the utilization of natural resources is the system of fees for the utilization of natural assets, including the fees for the utilization of the protected areas. The Constitution of the Republic of Serbia ("The Official Gazette of the Republic of Serbia", No. 98/2006, Article 87) stipulates that natural assets, as well as all other resources which have been defined as goods of general interest by the law, represent the state property which is utilized under the conditions and in the manner stipulated by the law.

According to the results of the last agricultural census from 2012, Serbia has 5,346,596 hectares of total available agricultural land, which represents 60% of the territory of Serbia and it offers ecosystem services of vital importance for human health and welfare. As a part of this surface, the utilized agricultural land spreads over the territory of 3,437,423 hectares. The figure X shows the allocation of total available agricultural land, according to the utilization categories. Within the utilized agricultural land, more than 70% belongs to arable land, whereas meadows and pastures spread over about twenty percent of the land.

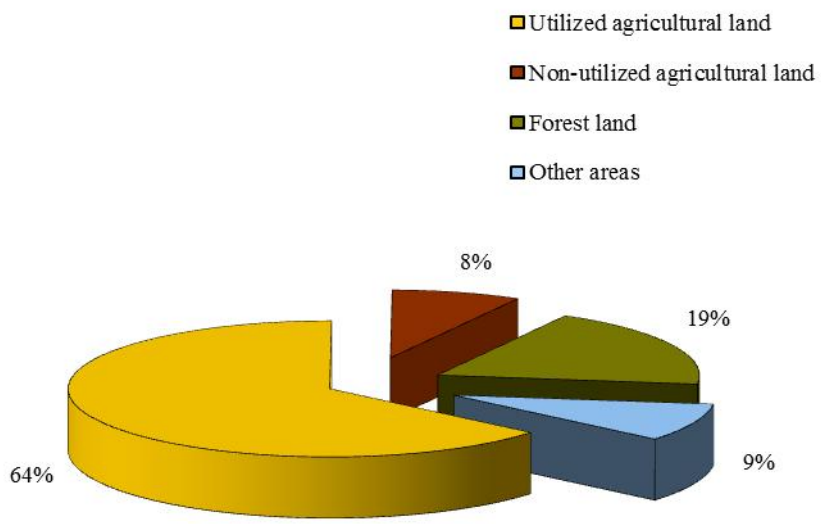


Figure II - Allocation of total available land per categories of utilization

Organic production in the Republic of Serbia, based on the data of the Serbian Chamber of Commerce, is currently being realized on the surface of 7,500 ha (without the areas which are used for the collection of wild strawberry fruit, mushrooms and medicinal herbs), including certified products and the products in the process of obtaining the organic product certificate.

The management of the fish stock in the fishing waters, which includes the conservation and sustainable utilization of the fish stock as natural resources and goods of general interest, is regulated by the Law on the Conservation and Sustainable Utilization of the Fish Stock ("The Official Gazette of the Republic of Serbia", No. 36/2009). Out of the total number of the species that live in the Serbian waters, about 50 species are subject to commercial and recreational fishing. From the standpoint of commercial fishing, 29 fish species have a larger or minor economic importance, of which 12 species represent the target group for commercial fishing. The other species represent accompanying and occasional catch and are of secondary economic importance. Recreational fishing includes about 45 species, but in this case as well, only 50% of this number represents the target group (Živković *et al.*, 2011).

According to the data from the National Forest Inventory (Banković *et al.*, 2009), where the last comprehensive evaluation of the forest resources was made, Serbia is a medium-forested country. Out of the total territory, 29.1% is under forests (in central Serbia 37.1% and in Vojvodina 7.1%). Other forest land, which according to the international definition includes thickets and shrubberies, stretches over 4.9%. In comparison with the reference year 1979, the increase of areas covered with forests amounts to 5.2%.

In comparison with the total covered forest the forest stock of Serbia is dominated by coppice forests which make 64.7%. Natural high stands cover 27.5% of the territory, whereas artificially raised stands with cultures stretch over 7.8%. The table below shows the state of forests in Serbia according to their naturalness.

Table I - State of forests according to their naturalness.
Source: The National Forest Inventory, 2009

Naturalness	Surface	
	ha	%
Forests without human intervention	1200	0.1
Semi-natural forests	2076400	92.1
Plantations	174800	7.8

From the point of biodiversity and ecosystem services, high stands of natural origin are the most important. In the natural stands, 38 species of trees have been identified, two of them being allochthonous. The most represented species is beech with a share of 57.1% in the total volume. Other species individually make less than 10% of the forest stock, whereas only 10 species make a share of more than 1% each.

A significant indicator of the state of forests and relationship toward the principle of sustainable forest management is the quantity of dead trees in Serbia. The total volume of dead trees in the Serbian forests amounts to 16,260,414 m^3 per hectare, i.e. the total concentration of the dead trees in the Serbian forests amounts to 7.22 m^3 per hectare and it is higher in Vojvodina (7.75 m^3 per hectare) than in central Serbia (7.18 m^3 per hectare).

Forest ecosystems provide a large number of services, and one of highly important services is the large capacity for carbon accumulation and release. The Table II shows carbon reserves in relation to the origin of forests.

Table II - Carbon reserves in relation to the origin of forests.
Source: The National forest Inventory, 2009

Origin of forests	Surface	Volume	Carbon
	ha	m^3	t
High natural stands	621,200	157,511,262.8	50,411,688.6
Coppice stands	1,456,400	181,188,914.2	63,733,764.2
Artificially raised stands	174 800	23,787,240.6	6,091,897.6
Total	2,252,400	362,487,417.6	120,237,350.4

Collecting medicinal herbs and forest fruits in Serbia represents one of the traditional manners of provision of income for households in rural, highland areas of east, south and west Serbia. The cultivated surfaces under medicinal herbs are mostly located in Vojvodina. Fungi can be encountered all around Serbian territory. Collection from nature is performed by business entities which are registered for that activity, and according to the records of the Institute for Nature Protection and the Serbian Chamber of Commerce, there are about 200 such entities. The analysis shows that most of them export raw material basis, and only a small portion performs processing into semi-finished products or finished products for further export. According to the data of the Serbian Chamber of Commerce, in 2012 the turnover of medicinal and aromatic herbs amounted to more than 24.5 million dollars, of which the income from export amounted to 19 million dollars.

According to the data of the Forest Administration of the Ministry of Agriculture and Environmental Protection, the total surface of 355 hunting areas in Serbia is 7,680,747 ha (204 hunting areas on 5,525,782 ha in Central Serbia and 151 hunting areas on 2,154,966 ha in Vojvodina).

PART II

The Government of the Republic of Serbia adopted the Biodiversity Strategy of the Republic of Serbia and the Action Plan for the period from 2011–2018 in February, 2011 ("The Official Gazette of the Republic of Serbia", No. 13/2011). The Biodiversity Strategy of the Republic of Serbia establishes basic principles for the conservation of biodiversity in Serbia pursuant to the principles of the European Union. Within the process of harmonization between Serbian and EU legislations, an overview of biodiversity (species, ecosystem, genetic) has been provided, as well as the system for the conservation of biodiversity (protected species, protected areas and ecological networks), then the institutional, legislative and financial frameworks for the conservation of biodiversity and particularly factors and causes of endangerment (pressures, direct and indirect factors). The Biodiversity Strategy and the Action plan define 11 strategic goals/areas and 28 for the conservation of biodiversity in Serbia, with more than 140 different activities which are necessary for the realization of the established goals.

In order to fulfil the obligations taken by the signing of the Convention on Biological Diversity, with a focus on Article 6 of the Convention and the Decision No. 2 from the conference of the signatory countries of the Convention on Biological Diversity held in Japan in 2010 (CBD COP Decision X/2), a review of the national strategy has been started. The process of the review of the Strategy is coordinated by the Ministry of Agriculture and Environmental Protection (which has formed a work group for this purpose), in cooperation with the UNDP, and within the project "Planning of the Conservation of Biodiversity at the National Level as a Support to the Implementation of the Strategic plan of the Convention on Biological Diversity for the period from 2011–2020 in the Republic of Serbia". The project is being implemented starting from 2013, within the Biodiversity Enabling Activities (BDEA) financed by the Global Environment Fund.

Since the Fourth National Report, large political changes have occurred in Serbia and they have reflected on the creation of policy for the conservation of nature and biodiversity and on the definition of the institutional frame which deals with these issues. The ministry competent for environmental protection has undergone significant changes and revisions. Two ministries were formed from the Ministry of Environmental Protection and Spatial Planning in 2012 – the Ministry of Energy, Development and Environmental Protection, which is competent for environmental protection and conservation of nature and the Ministry of Natural Resources, Mining and Spatial Planning, which is competent for the system of protection and sustainable development of natural riches, i.e. resources (the Ministries Act, "The Official Gazette of the Republic of Serbia", number 72/2012). Based on the Law on the Termination of the Law on Environmental Protection Fund ("The Official Gazette of the Republic of Serbia", No. 93/2012), the Environmental Protection Fund was cancelled. Since 2014, pursuant to the valid Ministries Act ("The Official Gazette of the Republic of Serbia", No. 44/2014), the competences in the area of environmental protection and the conservation of nature lie within the Ministry of Agriculture and Environmental Protection.

The legislative framework has been improved by amendment and adoption of number of acts in nature protection and other related sectors. Among them the most important are:

- the National Strategy for Sustainable Utilization of Natural Resources and Goods ("The Official Gazette of the Republic of Serbia", No. 33/2012),
- the National Environmental Approximation Strategy for the Republic of Serbia ("The Official Gazette of the Republic of Serbia", No. 80/2011) (NEAS), for the sake of negotiations with the EU in the most efficient manner within Chapter 27,
- the Law on the Verification of International Treaty on Plant Genetic Resources for Food and Agriculture ("The Official Gazette of the Republic of Serbia – International Treaties", No. 1/2013) has been enacted,
- the Nagoya Protocol which was signed in 2011.

In addition many acts which are of particular importance for biodiversity conservation are currently being revised, those are:

- the Law on Nature Conservation;
- the Law on Environmental Protection;
- the National plan for the realization of the National Program for Environmental Protection;
- the Rulebook on Ecological Network.

The Habitats Directive (92/43/EEC) has been almost completely transposed through the law and the accompanying sublegal acts. The total transposition (Article 8.6 of the Directive) will occur with the accession to the EU, when the network of the protected areas which has been formed according to the requests of the Directives will formally become a constituent part of the European ecological network Natura 2000. In order to improve the implementation of Article 6 of the Habitats Directive, the Rulebook on Appropriate Assessment, which will more closely stipulate the procedure, content, deadlines, manner of implementation of the appropriate assessment for the purpose of the conservation of ecologically important areas, is currently being developed.

The Birds Directive (2009/14/EEC) has been completely transposed. Through the Twinning project "Enhancing administrative capacities for the protected areas in Serbia (Natura 2000)", which has been implemented within the period from 2010–2012, a preliminary list of SPA areas has been created, pursuant to the Birds Directive and IBA database. According to that, total transposition of both Directives through national legislation has been assessed. Bearing in mind the process of implementation of the Directives, the capacities, financial assets and scientific researches need to be continuously enhanced during the implementation of the strategic plan until 2020, in order to secure resources for complete identification, conservation and management of Natura 2000 areas in Serbia.

Within the analysed period from 2011–2013, pursuant to the Bern Convention, the Republic of Serbia submitted several thematic reports related to the illegal killing, trapping and trading with wild birds, the conservation of invertebrates, the promotion of hamster *Cricetus cricetus* protection, the conservation of fungi in Europe and the European code of behaviour regarding pests and alien invasive species in Serbia.

Within the project "The Planning of Conservation of Biodiversity at the National Level as a Support to the Implementation of the Strategic Plan of the Convention on Biological Diversity for the Period from 2011–2020 in the Republic of Serbia", Serbia has initiated a regional cooperation with other projects for the development of strategies for biodiversity which are being implemented in Macedonia, Bosnia and Herzegovina and Montenegro by the UNDP and UNEP offices. So far, three regional meetings have been held, starting points and further activities have been agreed, among which is the organization of joint side event at the twelfth meeting of the Convention member countries.

The synergy with other initiatives in the region has been recognized in the initiative of 8 countries of the Dinaric Arc (Albania, Bosnia and Herzegovina, Croatia, Montenegro, Serbia, Slovenia, FYR Macedonia and Kosovo) under the name "Big Win for Dinaric Arc" and "Big Win 2", which included joint work on the improvement of the protected areas, the enhancement of the planning process in nature conservation and the evaluation of the economic value of natural resources, the inclusion of the goals of nature conservation into the plans for economic development in fishing, forestry, agriculture, energetics, spatial planning and through a more intense intersectoral cooperation.

Within the activities for the implementation of the Convention on Cooperation in the Protection and Sustainable Utilization of the Danube River through work of the International Commission for the Protection of the Danube River, the Third Joint Danube Research has been realized, in order to obtain reliable and comparable data necessary for the planning process and the adoption of adequate measures, as well as to monitor the effect of the made decisions.

PART III

Within the period from 2011–2013, certain measures have been implemented by the governmental institutions, civil society organizations, local administrations and other organizations in order to support the fulfilment of the goals set in the Biodiversity Strategy. The preliminary analysis of the progress in the implementation of the Biodiversity Strategy of the Republic of Serbia and the Action plan for the period from 2011 to 2018, in comparison with the set goals, has established that most measures have been implemented in the realization of the activities which relate to the fulfillment of two *strategic goals* – **conservation of biodiversity and the protected areas system.** All of the stipulated activities have been started or are being implemented, except for the activity which is related to the implementation of the national analysis of sensitivity to climatic changes through the utilization of the existing geographically explicit models for the assessment of the sensitivity of the inland and fresh-water ecosystems to climatic changes. The activities and measures which relate to the financing of the protected areas have been insufficiently realized and elaborated.

Expert recommendations developed in the preliminary analysis of the national objectives in the process of harmonization with the Aichi Targets point out that more emphasis should be given to goals which relate to halting the loss of biodiversity through the integration of biodiversity into the activities of the government and the society (strategic goal A) and factors which lead to threatening of biodiversity, and which have been defined in the Biodiversity Strategy and the Action Plan, within the Strategic goals 1, 3, 5, 6, 8, 9, and 10. In particular, the goals which have not been precisely established and which relate to the Strategic goal B

and the management and utilization of the fish stock, invertebrates and aquatic plants should be more closely defined. As well, ecosystem services need to be included in the redefined goals in the sense of securing human health and well-being, according to the Strategic goal D.

At the Millennium Summit held in New York in September 2000, together with 189 other countries, Serbia signed the Millennium Declaration, which states the basic values on which international relationships in the 21st century are established: freedom, equality, solidarity, tolerance, reverence of nature and division of responsibility. The overview of the realization of the Millennium Development Goals has been adopted by the Republic of Serbia in 2005, and it represents a part of the Report on progress made in all the countries by the implementation of the Millennium Development Goals for the period 2000–2005. In 2006, the National goals and tasks until 2015 were defined in Serbia. In 2013, the UNDP performed the assessment of the progress of Serbia observed through the chosen indicators, for the periods 2006–2009–2012, based on the available and relevant data (UNDP, 2013). The analysis has shown that the surface of the forested land had increased, the number of households which utilize solid fuel had halved. The increase of the emission of carbon dioxide had been registered in 2009, but it was followed by the decrease in 2012.

In 2012, Serbia was elected by the UN as one of 56 countries for the initiation of the national consultations about the sustainable development goals after 2015 ("Post-2015 National Consultations in Serbia"). In 2013, the initiative "Serbia We Want – Srbija kakvu želim" was a part of the most encompassing global consultative process of the United Nations, which was implemented under the slogan ""The World We Want 2015". The goal of the open consultations, especially with the civil society, was to recognize the problems that exist in the world and propose the manner of their resolution, as well as create strategic coalitions and partnerships that could help in the formation of the development agenda after 2015.

1. BIODIVERSITY IN SERBIA – STATUS, TRENDS AND THREATS; SIGNIFICANCE OF BIODIVERSITY FOR HUMAN WELL-BEING

The Republic of Serbia stretches over 88 361 km^2, which represents about 2% of the European continent. According to the data of the Institute of Statistics of the Republic of Serbia from 2014 (without data for AP Kosovo and Metohija), the estimated number of citizens in January 2013 was 7 181 505 and population density 92,8 inhabitants per square kilometre. The total number of settlements in Serbia is 6 158.

Serbia belongs to the countries of Central and Eastern Europe. The Pannonian Basin stretches over the northern part of the country, whereas the remaining, central and southern parts are for their largest part highland areas. The mountains belong to the systems of Rhodope, Carpathian, Balkan, Dinaric and the Skardo-Pindus massifs. Serbia abounds in natural and historical heritage and represents one of the most important centres of biological and geological diversity in Europe.

1.1. Abiotic and biotic factors of biodiversity in Serbia

Climate, pedologic and vegetation-ecosystem image of Serbia represents a mosaic within which, in a small space, almost all of European zone types of climate, land and biomes, i.e. their modifications, alternate. There are two basic types of zonal climate in Serbia (Stevanović & Stevanović, 1995): a typical moderate continental climate and a dry continental climate. Due to the mountainous relief and the present altitudinal zonation of climate factors, mountain climate is characteristic for mountainous and high-mountainous regions, with a series of transitional forms and variants.

According to the climatic regionalization of Serbia and the classification of the terrestrial ecosystems of geobiosphere, two basic zonobiomes stand out in the territory of Serbia:

- Zonobiome of deciduous (broadleaf) forests – occurs under conditions of moderate climate with short periods of frosts and on brown and grey forest soils. In the territory of the Republic of Serbia, this zonobiome is predominantly represented by oak and beech forests;
- Zonobiome of steppes – dry moderate continental type of climate with cold winters, chernozem soil as the zone soil and steppe vegetation (in Serbia, it is mostly represented by forest-steppe).

The mountainous relief of Serbia is conditioned by altitudinal zonation and orobiome character. In the territory of the Republic of Serbia, two basic types of orobiomes stand out and they are somewhat equivalent to zonobiomes of the northern Holarctic:

- Zonobiome (orobiome) of coniferous boreal forests – occurs under the conditions of cold moderate climate on spodosol soils. In Serbia it stretches over the subalpine belt, in zones of mountainous climate of the continental part of the country.
- Zonobiome (orobiome) of high mountain "tundra" – occurs on the initial soils under the conditions of Alpine climate of the highest mountains in Serbia.

The macro relief of Serbia encompasses two basic tectonic units: the Pannonian Basin (plain regions of the Pannonian Basin) and the highland area of the central part of the country. The Pannonian basin, whose southern part belongs to Serbia, encompasses the alluvial plains and river terraces along large rivers (such as the Danube and Tisza Rivers), loess plateaus (Banat, Titel, Telečka and Srem loess plateaus) and highland elevations (island mountains such as Fruška Gora and Vršačke Mountains). The highland area of Serbia is, in the orographic and geomorphological sense, extremely heterogeneous, complex and comprised of 5 mountain systems of different ages: the Rhodope Mountains, the Carpathian Mountains, the Balkan mountain system, the young fold mountains of the Dinarides, and Skadro-Pindus young fold mountain mass.

The geological constitution most often includes sedimentary rocks – limestone, dolomites, sandstone, clay, marlstones, sand and loess, as well as silicates and serpentinites from the group of igneous and metamorphic rocks. This variety of mineral composition of rocks directly influences the specific distribution of plants (vegetation). Three basic groups of plants (and vegetation) can be defined, taking into consideration mutual relationship of the geological component, the habitat and the mineral metabolism of the plants: the calcicole (calciphile), calcifuge and serpentinophile plants.

The basic **types of soil** in Serbia, each having several subtypes and variants, are: the automorphic, hygromorphic, halomorphic and sub-hydric soils.

1.2. Diversity of ecosystems in Serbia

The **basic types of habitats** in Serbia, defined in 2005 (Lakusic *et al*) and adapted to the classification of habitats of the European nature information system from 2012 (EUNIS) are the following:

- Continental surface water habitats;
- Marshland, peat land and bog habitats;
- Grassland habitats and habitats dominated by tall greens, moss and lichens;
- Heath land, shrub land habitats and tundra;
- Forests and other forest habitats;
- Intracontinental habitats without vegetation or with poorly developed vegetation;
- Regularly or recently cultivated agricultural, horticultural and domestic habitats ;
- Constructions, industrial or other artificial habitats;

The **diversity of ecosystems** in Serbia is primarily reflected in the diversity and specificity of the vegetation, the basic structural and production component of all continental ecosystems. In Serbia, 1399 associations and 59 vegetation classes have been registered (Lakušić, 2005).

The vegetation of Serbia is presented via a model of potential (primary) and real (recent) vegetation. Potential vegetation is typologically diverse and comprised of a relatively large number of communities or higher vegetation units. The real (recent) ecosystems of Serbia are comprised of 550-600 different phytocenoses. The basic types of phytocenoses of Serbia are:

1. FOREST AND SHRUB VEGETATION
1.1. Forests
    - Broadleaf deciduous forests

- Mixed deciduous-coniferous forests
- Coniferous forests

1.2. Shrub vegetation
- Broadleaf deciduous shrub vegetation
- Coniferous shrub vegetation
- Mixed shrub-herbaceous type of vegetation

2. HERBACEOUS VEGETATION

2.1. Inland herbaceous vegetation
- Lawns, pastures and continental rocky grounds
- Inland steppes, sandy and salty areas
- High mountainous meadows
- Rock creeps, deposits and recessions
- Rocks and cliffs
- High mountainous areas with firm snow and locations with long retention of snow

2.2. Aquatic herbaceous vegetation

2.3. Anthropo-dependent and anthropo-conditioned forms of herbaceous vegetation

The most important local and regional centers of ecosystem diversity in Serbia which are characterized by a large number of endemic, relict and endemic-relict communities are:

- High mountain areas of Kopaonik, Tara, Šarplanina, Prokletije, Stara planina and Suva planina,
- Sand and steppe habitats of Deliblato and Subotica-Horgoš sands and mosaic salty areas in Banat and Bačka in Vojvodina
- Refugial areas, such as canyons and gorges (the Đerdap gorge, the canyon of the Drina River, Sićevačka gorge, the valley of the Pčinja River).

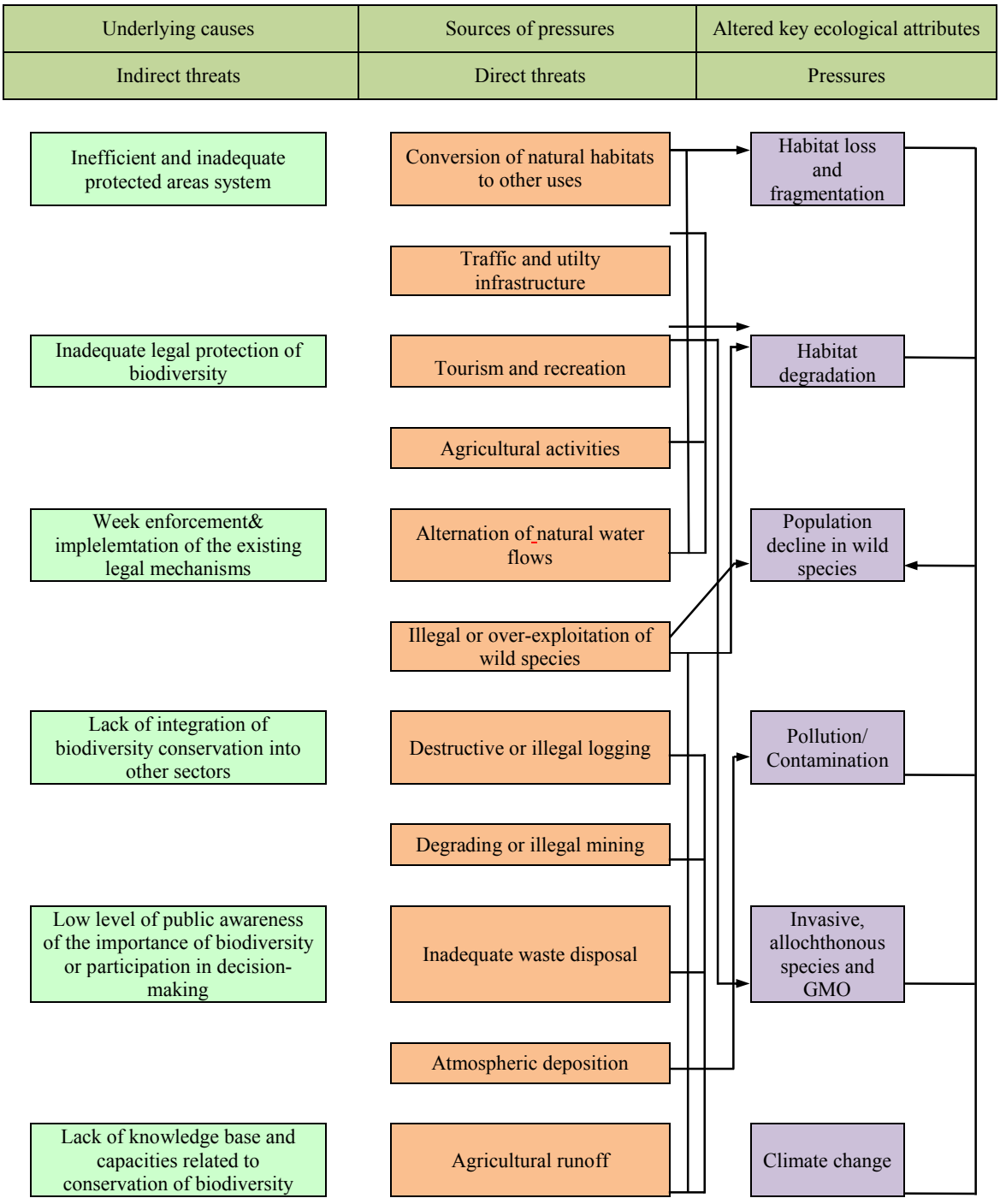
The following are the basic types of zonal ecosystems of Serbia:

1) Ecosystems of termophile sub-Mediterranean deciduous *Carpinus betulus* and *Ostyo-Carpinion orientalis* forests;
2) Ecosystems of mesophyll deciduous *Quercus petrae, Carpinus betulus* and *Fagus* forests (*Carpinion betuli* and *Fagion moesiacum*);
3) Ecosystems of termophile deciduous oak forests in the central and eastern parts of the Balkan Peninsula (*Quercion frainetto*);
4) Ecosystems of termophile deciduous forests in forest-prairie area of northeast parts of Serbia (*Aceri tatarici-Quercion*);
5) Ecosystems of xerophilic steppes (*Festucion rupicolae*);
6) Ecosystems of hydrophilic depression pedunculate oak forests *(Alno-Quercion roboris);*
7) Ecosystems of frigophilous coniferous forests which belong to the boreal type (*Vaccinio-Piceion*);
8) Ecosystems of frigophilous coniferous forests of Balkan relict endemic pines (*Pinion peucis* and *Pinion heldreichii);*
9) Ecosystems of subalpine bush vegetation *(Pinion mugo* and *Vaccinion uliginosi);*
10) Ecosystems of Alpine meadows, pastures and rocky grounds *(classes Festuco-Seslerietea* and *Juncetea trifidii).*

1.3. Threats to biodiversity in Serbia

Within the Biodiversity Strategy, pressures on Serbian biodiversity have been defined and an analysis of pressures and direct threats has been performed. The primary pressures exerted on biodiversity have been stated, as well as the sources of these pressures (direct endangering factors), and indirect endangering factors (basic causes of direct factors of biodiversity endangerment). The data on influences of direct endangering factors and pressures exerted on biodiversity of the Republic of Serbia are considered in the Strategy within the general context of influence on biodiversity.

Table 1. Diagram of pressures, threats and causes



The following ecosystems in Serbia are especially sensitive to endangering factors (Vasić, 1995):

1. Systems of inland aquatic ecosystems– they are particularly exposed to negative influences and pressures, such as pollution, change in water regime (captation, regulation, irrigation), natural successions (for example, overgrowth in mountain lakes and lowland ponds), hydro morphologic degradation, drainage programs for the purpose of expansion of agricultural areas, special regimes of exploitation which are not supported by conservation programs and measures (artificial lakes, fishponds), large and irregular changes in water level regime (flood areas near rivers – forelands and marshes), anthropogenic eutrophication which speeds up the succession (ponds and lakes), ecological isolation from other aquatic ecosystems, non-existence of communication between isolated aquatic ecosystems (ecological corridors which are necessary for survival of the population of aquatic organisms). Variable quantities of precipitation during the year, i.e. occurrence of dry periods, represent an additional pressure on aquatic ecosystems. Under the conditions of climate changes, increased pressure regarding lack of water occurs.

THE FORELAND OF THE LEFT DANUBE BANK

The floodplains along the Danube and Sava Rivers are sensitive ecosystems which represent extremely significant areas from the standpoint of protection of biodiversity and natural values. Through man's activity, these areas are now largely altered and disturbed in comparison with their original natural appearance. The degradation of these habitats occurred, above all, as a result of comprehensive melioration interventions, drainage and dewatering activities, construction of banks and bank fortifications. As a result of the above-mentioned activities, the flood surfaces, in which the natural water regime is preserved, are now very scarce and mostly limited to narrow belts between banks and rivers (foreland). In the recent past, a wide flood zone called Pančevački rit spread between the Tamiš and Danube rivers, and it provided a shelter for many rare and endangered plant and animal species. Due to the abrupt urbanization and melioration, larger part of this area has been drained in the past century and turned into housing and agrarian surfaces. The consequential wet areas have been preserved only within the narrow belt between the Tamiš and Danube River and dikes. Although their surfaces have been decreased, the flood areas in the Danube foreland in the vicinity of Belgrade still represent an exquisite natural value.

In order to conserve the natural values in these areas, the Institute for Nature Conservation of Serbia elaborated a Conservation study **"The Foreland of the Left Danube Bank near Belgrade"** as an expert basis for designation of protected area. The proposal includes two spacious flood zones Crvenka (Beljarica) and Kozara, which are intersected by armlets and numerous ponds and stagnant tributaries, which cover a surface of 1858 ha. The area is mostly covered by forest vegetation, gallery forests of willow and poplar, and Canadian poplar plantations. In these localities, several rare and endangered bird species nest, such as white-tailed eagle, black stork, ferruginous duck. The area is part of the Important Bird Area (IBA), and part of the national ecological network. Aquatic and wet habitats in these localities are important, both as the reproduction centres for amphibians and reptiles, and as spawning areas for several freshwater fish species.

The area is still relatively well preserved and it possesses significant natural values, but it is endangered by further degradation due to the vicinity of the urban zone. The protection of this part of the Danube plain is also significant as a potential eco-touristic destination which could be very well used for educational and promotional purposes since it lies close to Belgrade, the capital of Serbia.

Figure 1. Position of the foreland

Map 1. The Danube and Sava confluence

2. Specific isolated inland ecosystems – they represent unique, rare, specific isolated ecosystems, in a small and limited space, regardless of whether they are zonal or extra zonal in terms of spatial distribution. These ecosystems are exposed to negative influences and pressures of, above all, traffic and construction sectors, such as: occupation of space through construction of telecommunication and sports and recreation facilities on mountain peaks, exploitation of sediments and minerals (gravel pits, sand pits, quarries and similar), changes in the character of ecosystem due to change of the land use (flooding of mires because of artificial lakes), pressure exerted by tourism (construction of touristic infrastructure, increased number of tourists in sensitive ecosystems).
3. Inland naturally unstable ecosystems under the influence of natural and induced successions – these are primarily sands, exposed to spontaneous overgrowing of allochthonous vegetation or systematic aforestation; mountain steppes at which aforestation is performed, or authentic rock creep ecosystems in which erosion blocking programs are performed.
4. Forest climatogenic ecosystems – are exposed to numerous pressures, exerted primarily by the forestry sector, such as exploitation of trees for timber and fuel wood, decrease of habitat size and fragmentation of habitats because of construction of traffic networks or touristic-recreation complexes, inappropriate sanitary-cultivation measures and changes in the composition and structure through the introduction of allochthonous species and maintenance of "forest order", the change of composition on the account of relict communities, the change in the regime of a factor, which results in succession or degradation (for example change in moisture regime or constant acid precipitation),

low age diversity, i.e. even-aged forests which have a narrow adaptation valence and cannot permanently maintain the composition, structure and ecological character under variable environmental conditions.

5. „Underground“ ecosystems – they are particularly sensitive to pollution of groundwater; captation, change in the flow of groundwater and other hydrotechnical interventions; demolition of cave ornaments as well as inadequate adaptation of caves for visitors, which leads to drying and overheating and to spreading of non-native species, occur.

Active measures for protection of nature – projects of revitalization, recovery, and monitoring of the habitats and species in the territory of Vojvodina

With the aim of conservation of natural heritage of the Autonomous Province of Vojvodina, the Provincial Secretariat for Urban Planning, Construction and Environmental Protection, through its Sector for protection and improvement of natural goods and biodiversity, performs monitoring, protection and improvement operations in relation to natural values and biodiversity. Special attention is paid to conservation, recovery and revitalization of sensitive ecosystems, such as wet habitats, salty areas, steppes and sandy areas. Also, significant emphasis is put on the improvement of ecologic state of natural and semi-natural habitats through removal of allochthonous invasive species. Some of the realized project activities within the period from 2011 to 2013 are the following:

- Improvement of management of Special Nature Reserve (SNR) Deliblatska peščara, by recovery and maintenance of steppe habitats at Korn locality, by the establishment of feeding stations for birds of prey and by introduction of electronic surveilance system;

- Recovery of Potkovica locality at SNR Obedska bara by removing of mud and sediments and by widening of a canal (depression) which links the pond with Sava river, revitalization and recovery of meadow habitats via mowing and stump chipping, as well as removal of river locust;

- Recovery of autochthonous forest ecosystems in the Fruška gora National Park through the suppression of invasive and overpopulated autochthonous species, the revitalization and maintenance of meadow habitats and the maintenance of feeding stations for birds of prey;

- Maintenance of water regime at SNR Slano Kopovo, the monitoring of salinity and level of underground waters, the revitalization of salt meadows and pastures;

- Removal of invasive allochthonous plant species by mowing and mulching on steppe fragments in the SNR Ludaško jezero, SNR Selevenjske pustare and the area with extraordinary characteristics Subotička peščara;

- Revitalization and promotion of the locality Kurjačka greda in the SNR Koviljsko-petrovaradinski rit, recovery and revitalization of aquatic habitats at the locality Šlajz-Tikvara;

- Cleaning meadow and marginal forest ecosystems from allochthonous invasive species at the locality Vajlerka in the SNR Zasavica;

- Revitalization of Stari Begej by removal of sludge from the river bed, revitalization of forest belt on the coast of Stari Begej, removal of invasive plant species;

- Recovery and revitalization of protected area of the Nature Park Jegrička by removal of mud from the river bed and removal of water vegetation.

1.3.1. Pressures on biodiversity in Serbia - examples

1. Fires in protected areas

During the summer of 2013, a forest fire which occurred in one part of the protected area Nature park Mokra Gora had a combined character (tall and ground) and spread over nine departments of forest ecosystems in the forest management unit Mokra Gora – Kršanje. Preliminary field research conducted by the experts from the Institute for Nature Conservation of Serbia and from the management body of the park, has shown that fires had invoked changes in biogeocenotic balance. Since the area is significant for conservation of many rare and significant plant and animal species, the expert team made a proposal of measures to alleviate the consequences of the fire. The measures have been determined in order to minimize the negative effects, enable revitalization of degraded surfaces and create conditions for sustainable usage.

2. Impacts of agricultural production

The extensive agricultural activities have formed ecologically significant cultivated areas, which supported the high level of biodiversity. However, the processes of agricultural intensification and abandonment of villages have negative consequences on biodiversity. The abundance of individual species and the diversity of habitats, primarily meadows and pastures, have been maintained for years all over Serbia by low-intensity agricultural production. Mountain pastures, for example, are rich with various plant communities. However, due to the decrease of grazing catlle, the pastures which normally abound in various species are occupied by juniper (*Juniperus sp.*), blueberry (*Vaccinium sp.*) and other bush competitive invasive species. Such changes in pasture habitats lead to a decrease in population numbers, and even extinction of some plant and animal species.

Certain negative impacts of agriculture on biodiversity of Serbia have been stated below:

- Excessive application of artificial fertilizers and pesticides causes various impact on natural habitats, primarily in the soil, and on a broader level, impact on agroecosystems and the environment as a whole. Currently, there is no exact data on this type of pressure, not only at the regional levels, but also for the Serbia in total. The monitoring of the total quantity of utilized mineral fertilizer per unit of surface of agricultural land and agents for plant protection has not been established. Due to insufficient reliability of source information, the Statistical Office of the Republic of Serbia has not published data on consumption of mineral fertilizers since 2002. Without the data on applied quantities of mineral fertilizer per surface unit of agricultural land, it is not possible to determine the pressure on the environment. In the Decree on the Programme for the systematic monitoring of land quality, the indicators for assessment of risk from degradation of land and the methodology for elaboration of remediate programs ("The Official Gazette of the Republic of Serbia", No. 88/10), criteria for evaluation of land pollution by certain elements have been provided, threshholds and remediate concentration values of hazardous and detrimental matters and the values that can point out to significant contamination of the land. The adoption of this Decree provided a basis for the enactment of a programme for systematic monitoring of land quality, which includes the establishment of state and local network

of localities for monitoring of land quality. Reports on the state of the land have been prepared and published by the Serbian Environmental Protection Agency since 2011.

- Pollution of land and eutrophication of shallow surface waters, lakes and other aquatic surfaces in Serbia is largely a consequence of uncontrolled drainage of liquid manure from cattle farms. Research of the Standing Conference of Towns and Municipalities has shown that the pollution of waters is a problem which every third municipality in Serbia has encountered. The main sources of nitrate pollution from agricultural production are animal manure and artificial fertilizers. Waste from slaughterhouses, especially in Vojvodina, also represents a significant factor of pollution with nutrients. Some specific measures have been taken for the decrease of industrial pollution of the Danube River in Serbia, such as construction of appropriate objects for storage of manure, purchase of equipment for scattering manure, recycling of organic manure, rationalization of utilization of artificial fertilizers and other activities.

- Irregularities in the utilization of state-owned land occur due to ploughing of salty meadows and pastures in order to obtain subventions, which leads to the decrease in surfaces of natural salty habitats and their transformation into wastelands. The resiliency of salty areas depends on the degree of saltiness, which means that spontaneous revitalization is relatively successful in the case of more salted types of habitats. The most endangered areas are mildly salty areas of the forest-steppe complexes. Ploughing these types of habitats creates degraded grass surfaces which are subject to expansion of invasive species. For example, in the period from autumn 2012 until spring 2014, more than 1000 ha of salty and steppe pastures have been ploughed, mulched or cultivated near Boka, Boćar and Novo Miloševo settlements in Vojvodina,. On that occasion, severe disturbance of natural habitat of many rare and protected species had occurred. Even though relevant institutions (Provincial institute for nature conservation, Inspection for nature conservation) have reacted and stipulated protection measures those activities have not been fully prevented.

- The diffuse pollution from agricultural surfaces endangers almost all fragments of natural habitats in Vojvodina. Besides the presence of toxic matters, the inflow of nitrogen and phosphorous changes the composition of living communities by decreasing the diversity of the species. Common reed successfully assimilates the surplus of nutritious matters and is capable of conquering habitats in which it does not occur under natural conditions, thus destroying rich natural communities of tall reeds and various meadow types. Cessation of pasture, i.e. regular mowing contributes to the expansion of common reed.

3. Energy – wind power plants and mini hydroelectric power plants

In comparison with conventional sources of energy, utilization of renewable energy sources decreases pollution and slows down climatic changes. However, if guidelines for protection of nature are not followed during planning and construction, the utilization of wind energy and construction of wind power plants can lead to disappearance and fragmentation of habitats. Therefore, in order to minimise the influence of the named technology, the development of plans for utilization of wind energy besides implementation of good practice, also requires strict compliance with the existing legal provisions that regulate the area of protection of the environment and nature (Safner *et al.,* 2013).

According to the data from the Register of Favoured Producers of Electric Power of the Ministry of Energy, Development and Environmental Protection (2013), seven wind power plants were registered in the incitement system in Serbia, and most of them have the status of temporarily favoured producers, with the total power of about 50 MW. The European Wind Energy Association – EWEA stated in its report for Serbia from 2013 that obtainment of a total of 2600 GW from wind power plants has been planned, at the following potential locations: Stara planina, Ozren, Vlasina, Rtanj, Deli Jovan, Crni vrh, Pešter, Zlatibor, Kopaonik, Divčibare and the plains in Vojvodina.

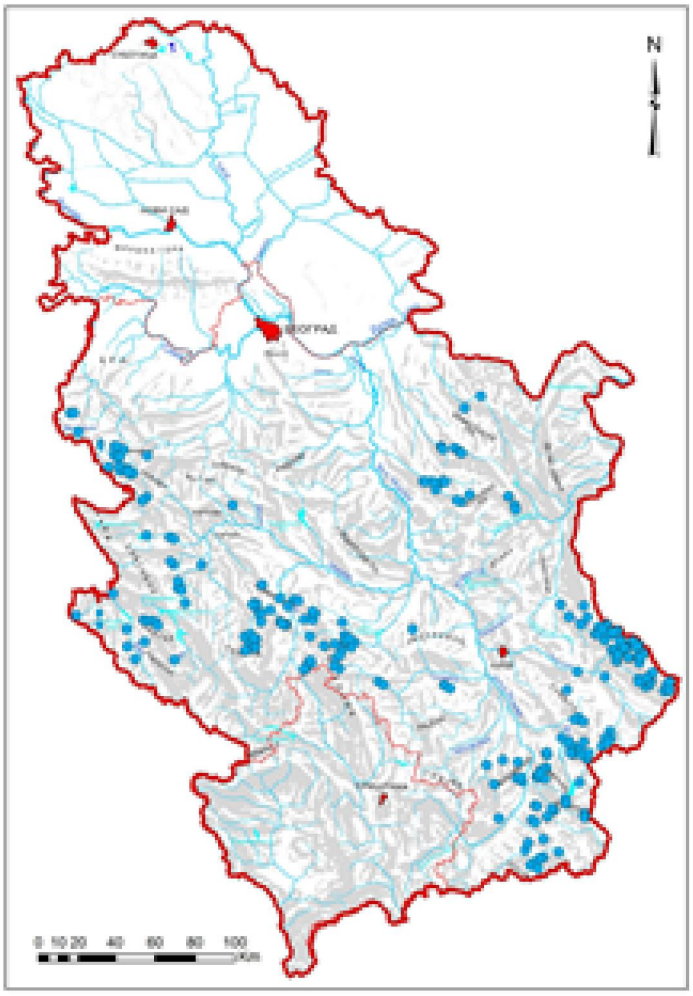
Most of negative influences of wind power plants are exerted on bird and bat populations – accidents caused by collisions with wind power plants, disturbance and abandonment of habitats, the barrier effect, loss or damage of habitats. Vojvodina is an area with high wind potential and it represents a space in which a large number of wind power plants is being planned. In the territory of Vojvodina, more than 300 bird species have been registered, of which 206 are under some regime of protection. In the process of defining the ecological network in AP Vojvodina (Sabadoš *et al.,* 2009), 10 bird species which are particularly sensitive to negative influence of unfavourably located wind power plants have been identified. It is estimated that inappropriate planning of wind power plants could lead to a significant impact on their populations of those species. The negative influences of wind power plants to bats are emphasized the most by virtue of collision with propellers or generator towers and barotrauma, caused by sudden change of air pressure in the vicinity of rotary generators (Paunović *et al.,* 2011). No wind power plants have been constructed in Serbia jet, so actual pressure exerted on biodiversity cannot be discussed. Taking into consideration the number and position of planned wind power plants, significant influence of wind power plants on certain elements of biodiversity can be expected.

During recent years, increased pressure of the growing need for hydro energy is being exerted on freshwater ecosystems in Southeast Europe. Some hydropower projects in the region have already been stopped due to the possibility of their unfavourable influence on biodiversity. In 2013, WWF published a Short Guide for investors, which promotes sustainable hydro energy in the Dinaric Arc.

One of the major problems regarding construction of mini hydro power plants is the inadequate definition of guaranteed minimum flow. Most often, the project determines a biological minimum of 10-15% of the medium annual flow, which often causes the quantity of flowing water downstream from water intake to be insufficient for subsistence of aquatic organisms. Derivations, which are sometimes several kilometers long, leave long sections of rivers with small flow, which leads to change in chemism, i.e. change of temperature and oxygen water regime. Also, in cases when pipelines are installed into river beds, destruction of riparian zone of the coastline can occur. The nature conservation regulation is often violated in planning and construction of some mini hydro power plants. For example, in the basins of the rivers Vlasina, Jošanica and Tripušnica (Pčinja), mini hydro power plants have been constructed without obtaining all necessary permits (i.e. conditions for nature protection from the Institute of Nature Conservation of Serbia). The plants (4-5) were constructed in a continuous line so that the water intake of one object is located in the immediate vicinity of the upstream project. Such construction has disturbed natural water flows along more than ten kilometres.

Tender for construction of mini hydroelectric power plants have been announced by the ministry in charge of energetic operations on two occasions in 2013. The first public invitation

to investors identified 317 potential locations for mini hydroelectric power plants, and the second public invitation to investors identified 145 potential locations for mini hydroelectric power plants. Many of the locations which are of interest for investors are in protected areas. The largest pressures have been registered in the areas of Stara Mountain, Golija, Zapadni Kučaj, Južna Morava, and also to the locations in the territories of municipalities of Babušnica, Dimitrovgrad, Trgovište, Surdulica, Ljubovija, Vranje, Crna Trava, Vladičin Han. According to the database of the Institute for Nature Conservation of Serbia, approximately 144 acts on conditions for nature protection for construction of hydroelectric power plants have been issued.



Map 2. Mini hydro power plants for which the acts on conditions for conservation of nature have been issued in the period 2011-2013.
Source: The Institute for Nature Conservation of Serbia

4. Exploitation of sand and gravel

With the aim of conservation of aquatic ecosystems, the Spatial plan of the Republic of Serbia envisages the exploitation of river materials, solely according to the regulated consents, which have been completely harmonized with the river regulation projects.

At the end of 2013, after recurring objections of citizens to uncontrolled exploitation of gravel in the watercourse of the Velika Morava River, the Ministry of Natural Resources, Mining and Spatial Planning performed unannounced inspection controls in fishing waters where exploitation of sand and gravel could endanger the fish stocks. The provisions of the Law on Protection and Sustainable Utilization of Fish Stocks define that it is forbidden to extract sand, gravel, stone, stumps from spawning areas, as well as to take all actions which endanger the fish stocks by violation of ecological characteristics of fishing waters. It has been concluded from the reports of the users of fishing areas that exploitation of gravel has been performed alongside the total length of the flow of the Velika, Zapadna and Južna Morava. Although these works did not endanger the fish stocks at that moment or prevent free migration of fish, there was a threat that the changes in river flow would endanger the river ecosystem in the future. The authorized representatives of the Republic Directorate for Water of the Ministry of Agriculture, Forestry and Water Management

provided assurance that intense control of the above-mentioned activities is being performed, pursuant to regulations.

Pursuant to conditions of nature protection of the Institute for Nature Conservation of Serbia, the exploitation of sand and gravel at smaller watercourses is limited to removal of existing drifts. However, in practice, the exploitation is often performed in significantly larger spaces, by partitioning the watercourse and by the devastation of flood zones along several hundred meters. The exploitation of gravel from riverbed changes its morphological and hydrological characteristics. Excavations of the bottom are performed up to the depths of 5 − 6 metres, which reaches underground waters and changes their status (the quality and the quantity). Based on the research of the Institute for Nature Conservation of Serbia, significant disturbance of habitats of strictly protected (European Crayfish, Tench, *Zingel balcanicus, Zingel streber*) and a large number of protected species and the prevention of the migration of fish and other aquatic animals have been recorded. In addition to that, the vegetation of the flood zone is destroyed; the stability of coast is decreased, with the simultaneous increase of flooding in the periods of high water levels. Uncontrolled exploitation of gravel endangers certain bird species which nest in these types of habitats. Particularly endangered are Common tern and Little tern, which nest at gravel shoals in the lower watercourse of the Drina River and at Velika Morava River near Paraćin. Common tern colony on the Velika Morava River was almost completely destroyed in 2008 by gravel exploitation activities.

Besides that, rinsing of sand and gravel additionally pollutes the river and changes its morphology. The value and duration of turbidity and the quantity of suspended matter in the water is drastically increased. This has a negative influence on young fish, i.e. their respiratory system (gill damage). Last, but not least, the negative effect of gravel exploitation on landscape characteristics of the area is obvious. This is especially noticeable in the area of the lower watercourse of the Drina, where large areas have been devastated by exploitation and where recultivation has never been performed.

The Directorate for Water and the Ministry of Agriculture and Environmental Protection control the gravel exploitation activities in conformity with the provisions which regulate these activities. The provisions of the Law on Protection and Sustainable Use of Fish Stocks in fish hatcheries forbid the extraction of sand, gravel, stones, stumps, as well as all actions which violate ecological characteristics of fishing waters and endanger the fish stocks.

An analysis of the issued conditions for the protection of nature, issued by the Institute for Nature Conservation of Serbia have shown that in the period 2011-2013 approximately 133 acts for exploitation of gravel and sand have been issued.

5. Regulation of rivers and flood prevention

According to the data from the Spatial Plan of the Republic of Serbia, about 2.08 million hectares is the surface in Serbia requires flood defence. The largest potential flooding surfaces are located in Vojvodina (where functional defence systems exist), in Posavina, Podrinje and Pomoravlje. The flood defence systems encompass 3550 km of embankments and 1200 km of regulation works. One of the global priorities in the region of the Danube basin of the WWF is the protection of freshwater ecosystems. Regarding the above-mentioned, the WWF supports the conservation of flood areas along riverbeds, as natural reservoirs which enable the storage of large quantities of water which is gradually and safely released into river courses and underground waters, mitigating the effect of floods. The protected areas in Serbia which can

decrease the consequences of floods are special nature reserves Gornje Podunavlje, Obedska bara, Koviljsko-petrovaradinski rit, Karađorđevo and Zasavica.

According to the Report of the expert UN team (UNDAC, 2014), floods which happened in May 2014 have caused damages to human health, environment and agriculture on the whole territory of Serbia. In the mid of May 2014, as a result of low pressure field which was formed over the Adriatic Sea, during four days a record in the quantity of precipitation has been recorded. Only in Western Serbia, the quantity of 200 mm of water deposit was recorded within a week; the quantity matches the average of three months of precipitation in this region. Tributaries in the Sava basin were exposed to precipitation the most, due to which a momentary increase of water level occurred, especially of the Kolubara River, which rose 7 m in two days. Due to the high water level of rivers, the Sava could not receive that quantity of water from the Kolubara River, which led to their flooding and a change in river course.

The UN report for the evaluation of catastrophes and coordination identifies potential dangers for the environment at 5 different locations. The report also states that a more detailed analysis needs to be performed and that a system for monitoring of further state should be established. It has been established that agriculture and the owners of small agricultural farms have suffered the most damage. This year's harvest is lost, and as a result the farmers will need help regarding supply of seed, fertilizers and mechanization. The problem of land pollution is obvious and it needs to be eliminated in order to secure food safety in the following period. The existing and potential landslides represent a special problem caused by floods, which can endanger human lives and property, and according to the Report, additional evaluation of the influence on the environment has been envisaged for them. The largest potential threats to the environment were storages of hazardous waste in the industrial parts of settlements Baric and Šabac. If the pollution of the land and underground waters occurred, negative influence would be reflected in the change of drinking water quality, as well as in the activities such as fishing and agriculture. The Report states that increased concentration of pesticides which came from the flooded agricultural surfaces into water has been registered.

In order to comprehend the consequences of the mentioned weather disaster, the Institute for Nature Conservation of Serbia, in cooperation with the managers of the protected areas, created a preliminary report on the consequences of disaster on protected areas. Consequences of two flood waves have been considered:

1. The first flood wave of lower intensity and shorter duration mostly left consequences on the area of Western and Southern Serbia. Regarding regulated natural goods, the most endangered ones were: the Natural monument "Đavolja varoš", where the damage from the flood did not directly endanger this phenomenon, only the access roads, and the Natural monument "Park in Vrnjačka banja", where the consequences are only reflected in the endangerment of one of the mineral water intakes (Snežnik) and a part of the park which was under water.

2. In the mid of May, a devastating flood wave with long duration hit Central and Western Serbia, i.e. the region between the rivers Zapadna Morava, Velika Morava, Drina and Sava. There are a large number of protected areas in this area.

Based on the preliminary evaluation of the consequences of the floods, it has been concluded that most of the protected areas were not damaged, although there is a possibility of potential

disturbance of their natural values. The consequences of the flood were primarily stated in the II and III degree protection regime. They are reflected in land erosion, impact on geologic occurrences and processes, relocation of the riverbed, demolition and uprooting of trees, and other. In addition, some of the populations of protected terrestrial species which inhabit the flooded areas could be affected. Possible indirect threats to aquatic ecosystems are increased pollution and spreading of invasive species (i.e. Rainbow trout from aquaculture).

Damages to infrastructure (roads, electric power, and other) within protected areas have also been identified. In certain protected areas some of the roads were blocked what caused temporary difficulties in regular conservation activities.

Certain changes, mostly with no larger consequences, happened in the landscape diversity of certain areas. The exact degree of damages will be determined after additional field visits and a detailed report of the Institute for Nature Conservation on the consequences of the flood on the nature.

Although the floods which happened in Serbia and the region in May, 2014 were disastrous, they resulted in increase of water and occurrence of numerous bird species that have not been registered before in the area of the Protected habitat "Bara Trskovača". In comparison to the recorded 72 bird species, it is evaluated that currently more than 150 bird species reside in this moist area, among which are the White-tailed eagle and Little bittern. Conservation of flooding habitats of Bara Trskovača, which does not impair flood protection of the nearby Platičevo village, can serve as a model for conservation of marsh ecosystems. Along with grazing (wet meadows) and utilization of biomass (reed), it provides self-sustainable system.

6. Drainage – protection from internal waters

In order to increase surface of arable land in Vojvodina, drainage of wet meadows and pastures is performed. Within the Pannonian biogeographic region, these habitats have been recognized as extremely endangered, thus representing priority types of habitats for conservation at the national and international level. The protected areas Landscape of exceptional characteristics Subotička peščara and Strict Nature Reserve Selevenjske pustare belong to the southeast rim of a spacious sand plateau, which is located between Tisa and Danube. The lakes and wet habitats in depressions are placed at the border between the sand area and the loess plateau, and they are supplied with water from the sand area. The joint action of the dewatering system and climate changes has decreased the level of underground water at the sands by 1.5-2.5 meters, which is why the habitat types connected to the succession series of lowland peats have almost disappeared. At numerous locations, sand steppe habitats have also been endangered. The database of the Provincial Institute for Nature Conservation shows that 75% of spatial units which contain Pannonian salt waters have been endangered by dewatering. Pastures which are influenced by increased levels of underground waters during wet years cannot be directly transformed into quality arable land. Amelioration canals drain them significantly before they would be drained naturally, which further leads to the degradation of these meadows and pastures.

1.4. Protected areas

1.4.1. Nationally designated protected areas

The protection of biodiversity in Serbia is achieved through the implementation of measures for protection and improvement of species, their populations, natural habitats and ecosystems (The Law on Environmental protection, "The Official Gazette of the Republic of Serbia", No. 36/2009, 88/2010 and 91/2010-correction), through the system of protected natural goods: protected areas, protected species and protected natural documents. The areas which have distinguished geological, biological, ecosystem and/or landscape diversity and are significant as habitats of birds and other migratory species important in compliance with international regulations can be declared as protected areas of general interest.

The categories of protected areas are: a strict nature reserve, special nature reserve, national park, natural monument, protected habitat, landscape of exceptional characteristics and nature park. These categories have not been harmonized with the IUCN categorization (Sekulić, 2013).

According to the data of the Institute for Nature Conservation of Serbia, the number of protected areas in Serbia is 474. The Table shows protected areas per categories and surface in Serbia. The Table includes 'the old' categories, which were defined by the previous laws on environmental protection and nature conservation and 'the new' categories which have been harmonized with the current Law on Environmental Protection. The total protected surface is 531 279 hectares, which represents 6% of the total area of Serbia. According to the Spatial plan of the Republic of Serbia an increase of up to 10% of the total territory has been envisaged until 2015, i.e. 12% until 2021. In comparison to the data presented in the Fourth National report to the CBD, there has been an increase in the number of protected areas (11 new areas have been designated since 2011) and the total protected surface by 0.14%.

Table 2. Number and surfaces of protected areas in Serbia

Protected areas	**SERBIA**	**CENTRAL SERBIA**	**AP VOJVODINA**	**AP KOSOVO AND METOHIA**	**AREA/ HA**
NATIONAL PARKS	5	3	1	1	158986
NATURE PARKS	18	5	12	1	213768
Regional national park-the old Law	4	1	3		
Nature park-the new Law	14	4	9	1	
LANDSCAPES	16	13	2	1	45656
Landscape of exceptional natural beauty-the old Law	5	5			
Landscape of exceptional characteristics-the new Law	11	8	2	1	
RESERVES	69	39	24	6	98954
Special nature reserve-the old Law	1			1	

Strict nature reserve-the old Law	40	28	8	4	
Scientific research reserve-the old Law	3	1	1	1	
Special nature reserve-the new Law	21	6	15		
General nature reserve-the new Law	4	4			
PROTECTED HABITAT	3	1	2		1120
NATURAL MONUMENTS	323	199	89	35	10306
Natural monument of botanical character	252	144	86	21	
Natural monument of geological and hydrological character	72	55	3	14	
AREAS WITH CULTURAL AND HISTORICAL SIGNIFICANCE	39	31	3	5	2489
Memorial natural monument-the old Law	23	15	3	5	
Natural area surrounding immobile natural goods-the old Law	16	16			
TOTAL	**474**	**290**	**131**	**49**	**531279**

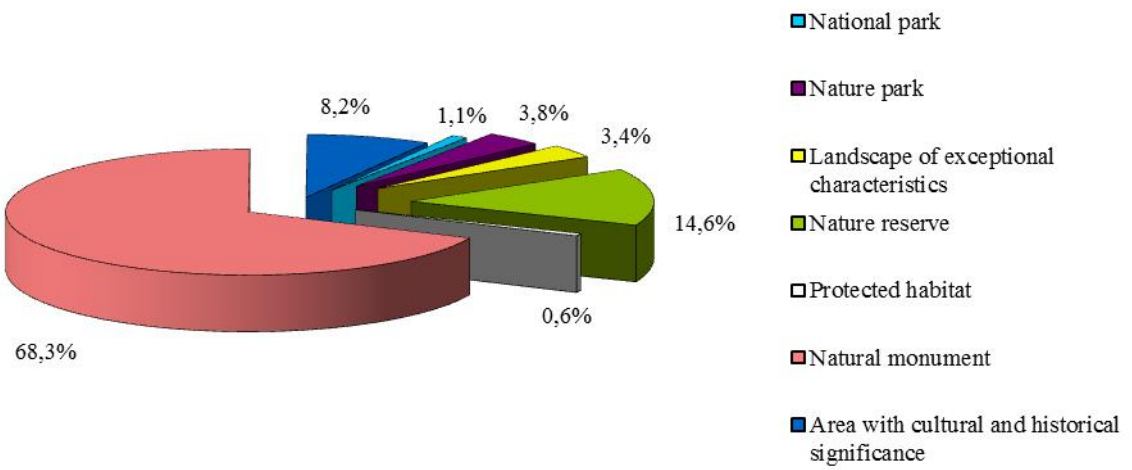


Figure 2. Protected areas by category in Serbia

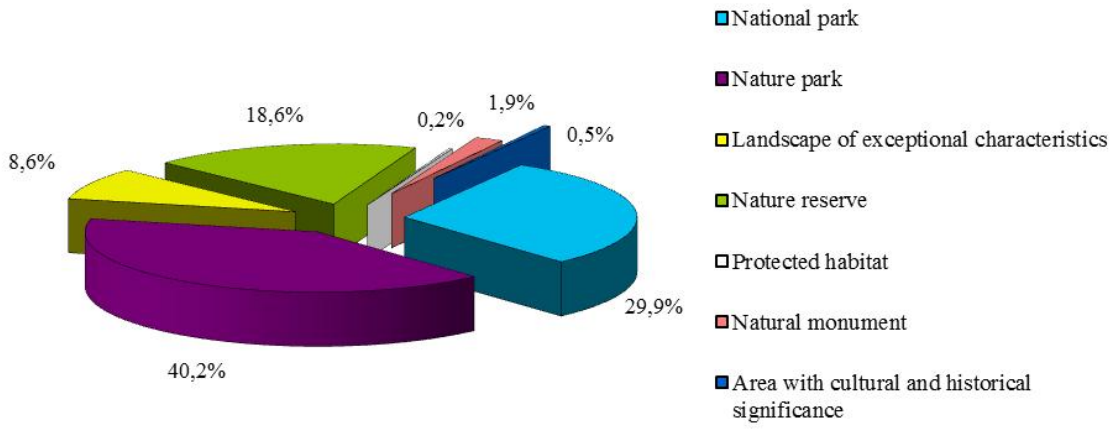


Figure 3. Surface of protected areas by category in Serbia

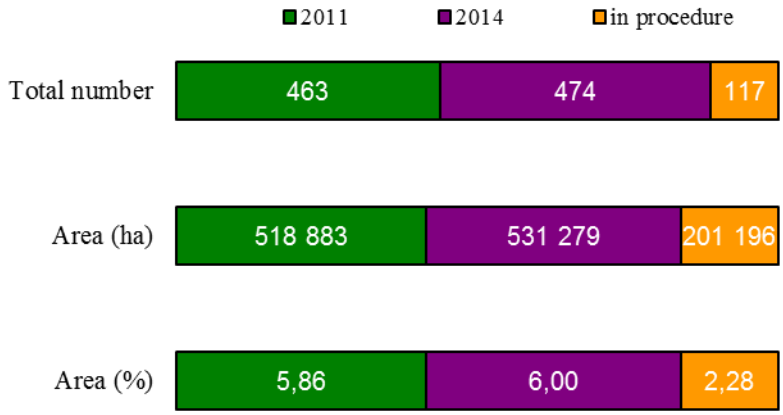


Figure 4. Protected areas and areas in protection procedure in Serbia: number, total surface in hectares and percentage of protected territory (comparison of the state in 2011 and 2014)

Some of areas which are currently in protection procedure (the process of adoption of proposals of acts on protection is currently ongoing, pursuant to Article 42 of the Law on Environmental Protection all natural goods which are in the protection procedure are considered protected) are: Landscapes of exceptional characteristics: Radan, Kamena Gora, Ozren-Jadovnik, Foreland of the left bank of the Danube, Karaš – Nera; Nature parks: Kučaj-Beljanica, Rusanda; Special nature reserves: Jerma, Rtanj, Suva planina, Peštersko polje, Donje Potisje; The areas for which protection studies are being prepared; Rudnik, Valjevske planine, lake Gružansko, Mojstirsko-draške mountains and Bosutske forests.

Different regimes of protection are established for each protected area, pursuant to the Law on Nature Conservation. There are three such regimes: the first, second and third degree of

protection. The protection regimes are determined by the act on proclamation, based on a protection study. The first degree protection regime (strict protection) is implemented in protected area or part thereof with original or slightly changed ecosystems of exceptional scientific and practical importance, which enables processes of natural succession and conservation of habitats and life communities in wilderness conditions. The second degree protection regime (active protection) is implemented in protected area or part thereof with partially changed ecosystems of high scientific and practical importance and particularly valuable landscapes and geo heritage objects.
The third degree protection regime (proactive protection) is implemented in protected area or part thereof with partially changed and/or changed ecosystems, landscape and geo heritage objects of scientific and practical importance.

The current statistics for the territories with a defined protection regime is as follows: 8 846 hectares (which represents 0.1% of the territory of the Republic of Serbia) are under the first degree protection regime; 77 077 hectares (0.87% of the Serbian territory) are under the second degree protection regime, and 2 238 hectares (0.025% of the territory of the Republic of Serbia) are under the third degree protection regime. The surface of strict nature reserves, scientific research reserves and one special nature reserve (as per former laws) amounts to 2 238 hectares (0.025% of the territory of the Republic of Serbia).

Map 3. Protected areas in Serbia. Source: The Institute for Nature Conservation of Serbia

Management of protected areas

Protection, management, usage and improvement of protected areas are implemented based on acts on proclamation of a protected area and a management plan for the protected area, which is developed for the time period of ten years. For certain protected areas, such as individual trees, rows of trees and similar, the act on proclamation can envisage enactment of a management plan for a shorter period of time. The management plan determines the manner in which protection, usage and management of the protected area are implemented, guidelines and priorities for protection and conservation of natural values of the protected area, as well as developmental guidelines, together with appreciation of the needs of the local population.

Pursuant to the Law on Environmental Protection, Article 67, the manager of the protected area can

be a legal entity, an entrepreneur and/or a natural person that fulfils certain professional, human and organizational conditions. For the purpose of managing one or more protected areas, a public enterprise, public institution or a company can be established. The fulfillment of the conditions is determined by the Ministry, i.e. the authority which is competent for the environmental protection operations in the autonomous province, i.e. the authority which is competent for the environmental protection operations of a local self-government unit, in the procedure of the preparation of the proposal of the proclamation act.

In order to provide support to the management of national parks and protected areas, Association of National Parks and Protected Areas of Serbia (NAPS) was established in 2010. Besides providing support to management of national parks and protected areas, the Association also deals with education in the area of environmental protection and sustainable development. A member of the Association can be a national park or any other protected area which is registered in accordance with the Law on Nature Conservation. All members of the Association have the rights and responsibilities which are defined by the Law, the Statute and other general acts.

Within the UNDP/GEF project "Ensuring financial sustainability of the protected area system of Serbia", evaluation of effectiveness of protected areas management in accordance with the Management Effectiveness Tracking Tool (METT) has been performed. The evaluation of management effectiveness was performed in 19 protected areas in 2010 and 2012. Progress has been evaluated by implementation of this method, whereat the total average increase of management effectiveness from 0.60 to 0.695 has been identified.

Financing of protected areas is provided from: the budget funds of the Republic of Serbia, autonomous province, i.e. unit of local self-government; a fee for the utilization of the protected area, income from the activities and management of the protected areas; the funds obtained for the realization of programmes, plans and projects in the area of nature conservation; donations, gifts and aid; other sources according to the law (pursuant to the Law on Environmental Protection and pursuant to the Law on termination of the Environmental Protection Fund – "The Official Gazette of the Republic of Serbia", No. 93/2012).

In 2010 and 2012, within the above-mentioned UNDP/GEF project, a complex analysis of sustainability of financing for the systems of protected areas was performed in accordance with the UNDP methodology (Financial Sustainability Scorecard for National Systems of Protected Areas). The implementation of this methodology lead to the assessment that progress has been made in sustainability of the financing system for the protected areas in Serbia, and that the realized improvement of state is an increase from 27.60% to 39.56%. Although the implementation of this metodology has certain limitations due to the specific protected areas system in Serbia, it can serve as an indicator for monitoring trends in financing of protected areas.

Promotion of protected areas and raising public awareness of biodiversity conservation

During the last couple of years, numerous observation points have been constructed in the protected natural goods in Serbia, educational tracks for visitors have been routed and arranged, numerous information boards have been set up, 3 touristic – educational maps have been printed, as well as many other promotional materials. Special attention has been dedicated to the construction of visitor centres in the protected natural goods.

The cycle of seminars of the Institute for Nature Conservation „ECO EDU“ represents a part of the system for the professional development of teachers in the area of environmental protection and nature conservation and it is realised through accredited programs of the Ministry of Education, Science and Technological Development of the Republic of Serbia. Programmes for development enable teachers to follow the newest concepts, guidelines, trends and knowledge in the area of environmental and nature protection, through the exchange of experiences in the area of education on environmental protection and the establishment of cooperation between teachers and experts. The seminars are realized through workshops, lectures, field practice and presentations, which improves teachers' skills which are necessary for the implementation of a cross-curricular approach to processing of topics within environmental and nature protection, develops critical approach to education regarding environmental protection and motivates the teachers to independently develop their professional skills and knowledge. Since 2004, more than 1000 biology and geography teachers from different schools and other educational institutions in Belgrade, Novi Sad, Niš, Užice, Kruševac, Kraljevo, Knjaževac, Lazarevac, Osečina, Čačak, Subotica, Kragujevac and Kosovska Mitrovica have participated in the seminars.

Since 2008, the Secretariat for Urban Planning, Construction and Environmental Protection has regularly organised a volunteer action named "A Work Day for Nature". The basic motive for the action is the inclusion of all entities which deal with the protection of nature, starting from ministries, institutes for nature conservation, managers of protected areas, citizens' associations, educational institutions, local communities, up to individual companies which perform different economic activities within direct implementation of activities for conservation and improvement of biodiversity. The turnout for these action is significant and there are often more than 100 participants.

1.4.2. Protected areas of international importance

In addition to the areas which are protected at a national level, areas whose protection is significant at an international level have also been identified in Serbia. Internationally significant areas represent a basis for the development of international cooperation and exchange of experience, in order to improve the protection of nature.

The Convention on Wetlands of International Importance, especially in the sense of bird habitats preservation (the Ramsar convention), represents a basis for activities at a national and international level, in the sense of protection and wise use of resources in wetland areas. In Serbia, ten sites have been identified and included in the list of **wetlands of international importance (the Ramsar sites)** and they stretch over a surface of 63919 hectares, which is equivalent to 0.72% of the territory of the Republic of Serbia. The Institute for Nature Conservation of Serbia drafted a preliminary list of 68 potential Ramsar site in Serbia. It also prepared nomination for the eleventh Ramsar site, which would include the Đerdap National park and Important bird area "Mala Vrbica".

According to the Convention Concerning the Protection of the World Cultural and Natural Heritage (UNESCO, 1972), within the "Man and Biosphere"' programme, the Nature park "Golija" was protected together with the surroundings of the Studenica monastery, as a **Biosphere reserve Golija – Studenica**. In 2013, a nomination for the Serbian part of the future pentalateral cross-border biosphere reserve Mura-Drava-Danube was prepared and

delivered. The proposed biosphere reserve will stretch over the territory of five countries: Austria, Slovenia, Hungary, Croatia and Serbia.

European ecological network Natura 2000 in Serbia

During the past few years, the Republic of Serbia has implemented a series of activities in order to prepare for the establishment of European ecological network Natura 2000. The bearer of these activities is the ministry competent for the protection of nature.

With the aim of necessary strengthening of public administration's capacities, Twinning project "Strengthening administrative capacities for the protected areas in Serbia (Natura 2000)" has been implemented in Serbia. Besides the ministry competent for the protection of nature, other key institutions and organizations in the area of protection of nature and relevant areas within the sector also participated in the project. The project was realised from January 2010 to June 2012, and financed by the European Union, from IPA 2007 fund. The project activities related to: harmonization of regulations in Serbia with European directives (Birds and Habitats Directives); establishment of a Natura 2000 network in linr with the European criteria; development of two pilot management plans in the Natura 2000 areas (the "Tara" National Park and Special nature reserve "Obedska bara") and strengthening the capacities for the development of Natura 2000 network in Serbia. As a result of this project, the first reference list of bird species has been created and potential special protection areas for these species have been identified, in accordance with the Birds Directive (Special Protection Areas – SPA). Also, the first reference list for types of habitats has been created as a proposal for Sites of Community Importance (SCI areas), in accordance with the Habitats Directive.

The Pilot Management Plan for the Tara National Park – Natura 2000

The pilot management plan for the Tara National Park was implemented within the Twinning project "Strengthening administrative capacities for protected areas in Serbia (Natura2000)". The management plan for Natura 2000 area contains a preliminary list of habitat types according to the EU Habitats Directive, a proposal of indicators for the evaluation of the conservational status of the recognized habitat types and goals of the conservation and protection for the named habitat types, according to the EU legislation. In addition to the general section on the values of biodiversity of this protected area, the document also contains a plan of activities with potential sources of financing, required funds and obligations. Some of the proposed activities have been realized, or are being currently realized, although this Plan only represents a draft, and not a definite plan, since the necessary guidelines at the national level have not been defined yet.

The plan also includes the following project activities:

"Monitoring of large carnivores through the implementation of infrared detection"
Goal: Improve the protection and management of large carnivores population in the Tara National Park
Activities: Establishment of basic parameters for large carnivores species population in the Tara National Park through usage of the so-called photo traps
Expected result: Established system of non-invasive monitoring of large carnivores

Source of funds: Subventions provided by the Ministry of Natural Resources, Mining and Spatial Planning, based on the contract on co-financing of the Management Program for the Tara National Park
Year of implementation: 2014

"Protection of mires at Predov krst"
Goal: To raise consciousness of the visitors to the national park and the local population of the values of wetlands
Source of funds: the Tara National Park
Year of implementation: 2012

Based on the analysis of recommendations of the above-mentioned Twinning project, the preparations for further development of Natura 2000 network in the Republic of Serbia were started in 2013, with the support of pre-accession funds IPA 2012. The expected results of this project are the established lists of potential Natura 2000 areas, identification of species and types of habitats, in compliance with EU Birds and Habitats Directives, as well as the purchase of equipment for the support of the information system for the development of Natura 2000 network.

Up to now, 61 sites have been nominated for the **European Emerald Network**. In 2009 42 **Important Bird Areas (IBA)** with the total coverage of 1259624 hectares, which represents 14.25% of the territory of the Republic of Serbia have been identified (Puzović *et al.,* 2009). Furthermore, 62 areas of **Important Plant Areas (IPA)** have been defined and they encompass a surface of 747300 ha or 8.5 % of the territory of the Republic of Serbia. Also, 40 areas of **Prime Butterfly Areas (PBA)** have been identified. The total surface of all PBA surfaces is 903643 hectares, which represents 10.2% of the territory of the Republic of Serbia.

The national ecological network

Certain protected areas which have been established by the Law on Nature Conservation, with a primary goal of conservation of biodiversity, as well as areas of international importance (Emerald network sites, IBA, IPA, PBA, Ramsar areas, border areas of ecological importance and certain areas of habitat types and wild species habitats) are a part of the ecological network of Serbia.
The Decree on ecological network ("The Official Gazette of the Republic of Serbia", No. 102/10) defines the ecological network, as well as more detailed manner of management and financing of the ecological network, with the aim of conservation of biological and landscape diversity, i.e. habitat types of special significance for conservation, renewal and/or improvement of disturbed habitats and conservation of certain species. The ecological network of Serbia is comprised of 101 areas and it represents an assembly of functionally connected or spatially close ecologically significant areas, which through their biogeographic presence and representativeness significantly contribute to the conservation of biodiversity and sustainable utilization of resources, including the ecologically significant areas of the EU Natura 2000.

The scientific and expert communities recommend specifying the criteria for the determination of areas of the ecological network and performing a review and amendment of the ecological network of Serbia, based on newer and more accurate data.

1.5. Protected species

Map 4: Ecologically significant areas in Serbia. Source: The Institute for Nature Conservation of Serbia).

Pursuant to the Law on Nature Conservation, wild species which are endangered or can become endangered, which have a special significance from the genetic, ecological, ecosystem, scientific, health, economic or other aspect, are protected as strictly protected or protected wild species. There are **1760** strictly protected and **853** protected wild species of plants, animals and fungi in Serbia (The Rulebook on proclamation and protection of strictly protected and protected wild species of plants, animals and fungi, "The Official Gazette of the Republic of Serbia", No. 5/2011 and 47/2011).

A special form of protection relates to the species that can be endangered due to exaggerated and uncontrolled collection from nature. Due to the changes which were made in 2011, 15 species were excluded from the lists of the Rules on proclamation and protection of strictly endangered and endangered wild species of plants, animal and fungi: *Corylus avellana, Equisetum arvense, Galium verum, Glechoma hederacea, Hedera helix, Juniperus communis* ssp. *nana, Melilotus officinalis, Ononis spinosa, Prunus spinosa, Rubus fruticosus, Rubus idaeus, Sambucus nigra, Tussilago farfara, Melissa officinalis ssp.* and *Viola macedonica.*

Of the species included in the list of protected wild species (Annex 2 of the Rulebook), there is a total number of **97** wild plant, animal and fungi species whose use and trade is being allowed. Of that number, there are **63** plant species (**2** species of fern and **61** seed bearing species), **15** species of fungi and **10** lichen species (complete *Usnea* genus, a total number of 8 species, except for strictly protected species) and **9** animal species (2 reptile species, 3 amphibian species and 4 invertebrate species).

The use of some species of mammals, birds and fish has been regulated by other acts, such as the Law on Game and Hunting ("The Official Gazette of the Republic of Serbia", No.

18/2010) and the Law on Protection and Sustainable Use of Fish Stocks ("The Official Gazette of the Republic of Serbia", No. 36/2009).

Pursuant to the Law on Nature Conservation, the Ministry of Agriculture and Environmental Protection issues licenses for research of strictly protected and protected wild species for scientific purposes. Prior to the issuing of a license, competent institute for nature conservation has to issue an opinion on possible effects of planned research on species and their populations. The records on issued licenses and reports after the realization of scientific research are kept by the ministry competent for the protection of nature and institutes for the protection of nature.

The Tables provide a comparative overview of the species in Serbia which are **strictly protected and protected** at the national level and are included in some regime of protection at the international level.

Group of organisms	Mammalia	Aves	Reptilia	Amphibia	Pisces	Invertebrata	Total	Fungi	Lichen	Total	Briophyta	Pteridophyta	Gymnosperma Angiosperma	Total	Charophyta	Rhodophyta	Total
No. of Orders	4	17	2	2	8	27	**60**	7	8	**15**	12	5	39	**56**	1	4	**5**
No. of Families	15	57	6	6	10	95	**189**	17	14	**31**	15	9	76	**100**	2	5	**7**
No. of Species	50	307	18	18	30	609	**1032**	38	37	**75**	47	22	558	**627**	15	10	**25**
Protection status																	
*	1						**1**										
**	1				1		**2**										
***		1					**1**										
1-I												1	11	**12**			
1-II	36	247	14	12	2	13	**324**										
1-II reserve	2						**2**										
1-III	9	57	4	6	18	1	**95**										
2-I		13					**13**										
2-II		178			5		**183**										
3-I		5	1		1		**7**										
3-II		48			5	1	**54**						40	**40**			
3-III		7					**7**										
4-II	22		4	5	17	17	**65**					4	20	**24**			
4-IV	41		14	12	2	22	**91**					8	22	**30**			
4-V				1	8	2	**11**										
5-I		117					**117**										
5-I-1		10					**10**										
5-II-2		35					**35**										
5-III-2		12					**12**										
Res. 6	20		4	6	17		**47**					3	16	**19**			
Res. 6 - new		5			3	17	**25**					1	9	**10**			

*Table 3. Overview of species in Serbia which are **strictly protected** at the national level and included in some regime of protection at the international level*

Table 4. Overview of the number of species in Serbia which are nationally protected and have a certain protection status at the international level

Group of organisms	Mammalia	Aves	Reptilia	Amphibia	Pisces	Invertebrata	Total	Fungi	Lichen	Total	Briophyta	Pteridophyta	Gymnosperma Angiosperma	Total
No. of Orders	6	9	2	1	8	14	**40**	5	1	**6**	3	4	34	**41**
No. of Families	14	12	2	1	10	40	**79**	9	1	**10**	6	7	62	**75**
No. of Species	30	35	2	3	34	154	**258**	26	11	**37**	10	8	541	**559**
Protection status														
****	1						**1**							
*****	1						**1**							
******	1						**1**							
*******		1					**1**							
********			2	3		4	**9**	15	3	**18**		1	62	**63**
1-I													4	**4**
1-II	2		1			3	**6**							
1-II reserve		1	1	3			**5**							
1-III	16	25			19		**60**							
2-II		14			1		**15**							
3-I		4					**4**							
3-II		1			1		**2**						20	**20**
3-III		4					**4**							
4-II	2		1		11	4	**18**						1	**1**
4-IV	2		2	1		4	**9**						2	**2**
4-V	3			2	10	1	**16**					1	5	**6**
5-II-1		12					**12**							
5-II-2		16					**16**							
5-III-1		4					**4**							
5-III-2		5					**5**							
L/R	16				28		**44**							
Res. 6	3		1		9		**13**						2	**2**
Res. 6 - new					1	2	**3**						1	**1**

Legend Table 3 and 4:
* - The species is strictly protected on the territory of Vojvodina, except in the hunting area of Deliblato sands and Vršac Mountains, where it has a status of the protected wild species
** - The species is strictly protected exclusively on the territory of Vojvodina
*** - The species is strictly protected exclusively in the areas above 500 m of height above sea level
**** - The species is protected as protected wild species, except in the parts of the territory of Vojvodina, where it has a status of the protected wild species
***** - The species is protected as protected wild species, except in the parts of the territory of Vojvodina, where it is protected as strictly protected wild species
****** - The species is protected as protected wild species, except in the parts of the territory of Vojvodina, where it is not protected
******* - The species is strictly protected exclusively in the areas up to 500 m of height above sea level

******** - The species is commercial and covered by provisions of the Directive on Control of Utilization and Trade with Wild Flora and Fauna
• 1-I,II,III, reserve – The Law on verification of the Convention on the Conservation of European Wildlife and Natural Habitats – "Official Gazette of RS – International contracts" No. 102/2007 (Bern Convention - Appendix I – Strictly protected flora species; Appendix II – Strictly protected wild fauna species; Appendix III – Protected fauna species, reserve – species for which the Republic of Serbia states reserves in relation to the text of the Convention)
• 2-I, II – The Law on verification of the Convention on the Conservation of Migratory Species of Wild Animals – "Official Gazette of RS – International contracts" No. 102/2007 (Bonn Convention – Annex I – Endangered migratory species; Annex II – Migratory species that should be object of the Contract, reserve – species for which the Republic of Serbia is expressing reserves in relation to the text of the Convention)
• 3-I,II,III – The Law on verification of the Convention on International Trade in Endangered Species of Wild Fauna and Flora – "Official Gazette of RS – International contracts" No. 11/2011 (CITES Convention – Appendix I – Species which are threatened by extinction, and are included in or can be included in trade; Appendix II – Species which currently may not be threatened by danger of extinction, but can be threatened if the trade with such a specimen is not subjected to strict rules and species that has to be subjected to regulations in order to establish an efficient control of trade in specimens which belong to individual species from this appendix; Appendix III – Species which is identified by any Party as subject to the regulations within its jurisdiction, in order to prevent or limit exploitation, as well as the species for which trade can be regulated only in cooperation with the other Parties)
• 4-I,II,IV,V – Directive on Conservation of Natural Habitats and Wild Plant and Animal Species - Council Directive - 92/43/EEC (Directive on Habitats – Addendum II – Animal and plant species of joint interest whose conservation requires proclamation of specially protected areas; Addendum IV – Animal and plant species of joint interest which needs strict protection; Addendum V – Animal and plant species of joint interest for whose extraction from nature and exploitation management measures have to be implemented)
• 5-I,II/1,II/2,III/1,III/2,III/3 – The Directive on Conservation of Wild Birds - Council Directive 79/409/EEC (Directive on Birds - Addendum I – Species with special measures of conservation; Addendum II/1 – Species which can be hunted in conformity with the national legislature, in the areas to which the Directive relates; Addendum II/2 – Species that can be hunted in conformity with the national legislature, in those member states in relation to which this is stated; Addendum III/1 – Species that can be sold, kept, transported and offered for sale, if it has been murdered or caught in conformity with the law or it has been obtained in some other legal manner; Addendum III/2 – Species that can be sold, kept, transported and offered for sale, if it has been murdered or caught in conformity with the law or it has been obtained in some other legal manner, and for which the member states can prescribe some limitations in their territories; III/3 – Species that can be sold, kept, transported and offered for sale, if it has been murdered or caught in conformity with the law or it has been obtained in some other legal manner, and for which the Committee will realize a study on its biological status).
• L – hunting species whose status and protection regime have been regulated by regulations in the area of hunting
• R – fishing species whose status and protection regime have been regulated by regulations in the area of fishing
• Res. 6 – Resolution 6 of the Standing Committee of the Convention on Protection of European Wild Species and Natural Habitats, 1998 (Bern Convention – Species which require special measures for protection of habitats)
• Res. 6 –new- Revised Appendix 1 of Resolution 6 (1998) of the Standing Committee of the Bern convention, 2011 (new species which require special measures for protection of habitats)

The project "Monitoring of Bird Species in the Tara National Park" is being implemented in 2013 and 2014. The goal of this project is to contribute to the protection of biodiversity of avifauna through the establishment of a monitoring system. The funds have been obtained from the subventions provided by the Ministry of Natural Resources, Mining and Spatial Planning, based on the contracts on co-financing of the Management program of the Tara National Park. The project is being realized in cooperation with the Bird Study and Protection Society of Serbia.

During the first year of the research, the following results were achieved:
1. Population size has been established for a number of endangered species;

2. Guidelines for long-term monitoring have been established, together with isolated key species, locations and proposed transects;
3. 10 boxes for nesting and monitoring of Ural owl (*Strix uralensis*) have been set up;
4. Database which includes recorded species and statuses of protection has been formed.

1.5.1. Diversity of macromycetes in Serbia

There are no precise and comprehensive data on fungi species in Serbia, and some estimations of the number of species range from 3000 to 6000 macromycetes. So far, 1300 species has been recorded in Serbia (Ivančević, 2006).

The International Union for Conservation of Nature (IUCN) treats protection of fungi with the same importance as the conservation of plants and animals. In 2007, the European Council adopted a Recommendation on conservation of fungi in Europe, to which the member states should adhere (Recommendation 132, 2007). These recommendations have been included in the programmes for conservation of nature in Serbia.

The Law on Nature Conservation from 2009 provides provisions on non-commercial fungi for the first time. Pursuant to the Rulebook on proclamation and protection of strictly protected and protected wild plant, animal and fungi species, certain fungi in Serbia obtained a status of protected and strictly protected species. Until then, legal regulations included only those fungi species which are collected for commercial purposes. In that manner, according to the above-mentioned Rules, 38 fungi and 27 lichen species have been included in the category of strictly protected species, whereas 26 fungi species and 11 lichen species have been included in the category of protected species. The Law provides a special treatment of protection of fungi habitats, in regard of the specific conditions of protection.

Evaluation of individual areas of importance for fungi population has been included in regular procedures implemented by national institutions which deal with conservation of nature. Formal criteria and tools for evaluation of status, trends and threats to fungi populations and species have been harmonized so that they can be used with ease in the administrative procedures. In the last three years, four areas in Serbia have been recommended for protection, through implementation of standardized evaluation of fungi status as one of the components of biodiversity, having taken into consideration the evaluation of other components of biodiversity as well.

Conservation of areas of importance to fungi

One forest area on the river island/peninsula Ada Ciganlija with an area of 21.25 ha was proposed for protection as an important habitat of fungi - Prime Mushroom Area (PMA), especially of the well-known and popular *Myriostoma coliforme* species, which is included in the category of endangered species. For the first time in Serbia, certain area was protected only because of the fungi which inhabit that area. In Europe, the species is recorded at a little over 150 localities and is included in the Red list in eighteen countries in Europe (Dahlberg & Croneborg 2006). This species is included in the proposal for the Appendix to the Berne Convention and is recommended for protection (Council of Europe Recommendation 132; 2007).

Measures for the protection and preservation of fungi diversity in Serbia during the past few years have been:
- Inclusion of rare and endangered fungi into legal regulations;
-Treatment of fungi in state documents (laws, strategies, etc.) as a special group of organisms, separated from plants and animals;
-Assessment of values of fungi biodiversity during the elaboration of study of proposed protected areas by governmental institutions;
-Establishment of protection of a single area (Ada Ciganlija, Belgrade) primarily for the purpose of conservation of biodiversity of fungi in that area;
-Implementation of international recommendations which relate to the conservation of fungi biodiversity.

1.5.2. Monitoring of strictly protected species and endangered habitat types in Serbia

Within its regular activities, the Provincial Institute for Nature Conservation and the Institute for Nature Conservation of Serbia performed monitoring of the following rare and endangered species and habitats during the period between 2011 and 2013:

- On the territory of AP Vojvodina: Autumn squill (*Scilla autumnalis*), Peony (*Paeonia officinalis* subsp. *banatica*), Pancic wormwood (*Artemisia pancici*), *Cirsium brachycephalum*, Pannonian knapweed (*Centaurea sadleriana*), Sand saffron (*Colchicum arenaria*), Sand iris (*Iris arenaria*), Tisza mayfly (*Palingenia longicauda*), *Theophilea cylindricollis*, European mudminnow (*Umbra krameri*), Great bustard (*Otis tarda*), Eastern imperial eagle (*Aquila heliaca*), shorebirds (Charadriiformes), European ground squirrel (*Spermophillus citellus*), forest-steppe habitats;

On the territory of Central Serbia: Wild peony (*Paeonia corallina* Retz.), Peony (*Paeonia officinalis* subsp. *officinalis*), Venus hair fern (*Adiantum capillus-veneris*), Marsh helleborine (*Epipactis palustris*), *Hypecoum pseudograndiflorum*, Gentian (*Gentiana lutea*), Lady's slipper (*Cypripedium calceolus*), *Tozzia alpina* ssp. *carpatica*, blueberry (*Vaccinium myrtillus*), *Astragalus glaucus*, Heather (*Calluna vulgaris*), Huchen (*Hucho hucho*), Sturgeon (Acipenseridae) and Herring (Clupeidae), common spadefoot toad (*Pelobates fuscus*), Mountain newt (*Ichtyosaura alpestris*), Greek tortoise (*Testudo graeca*), Hermann's tortoise (*Testudo hermanni*), Common European viper (*Vipera berus*), little tern (*Sterna albifrons*), Common tern (*Sterna hirundo*), European roller (*Coracias garrulus*), White-tailed eagle (*Haliaeetus albicilla*), Griffon vulture (*Gyps fulvus*), eagles (*Aquila*), bats (Chiroptera), Chamois (*Rupicapra rupicapra*), salt and sand habitats.

Protection and improvement of the status of protected areas, especially biodiversity and rare and endangered plant and animal species and their habitats

On the territory of AP Vojvodina, the number of smaller forest reserves and isolated, large trees has dramatically decreased during the last decades. Such trees represent a significant location for nesting of globally endangered Eastern imperial eagle *Aquila heliaca* and Saker falcon *Falco cherrug*, as well as several other rare species of birds of prey. With the aim of resolving this problem, the Bird Study and Protection Society of Serbia, with coordination of the Provincial secretariat, implements the project for improvement of habitat conditions for nesting of these species through the establishment of nesting platforms on high voltage powerlines across Vojvodina, as well as on appropriate trees in

steppe areas of the northern and central Banat. In this manner, favourable conditions and safe places for nesting of the eastern imperial eagle, saker falcon and other rare steppe birds of prey are provided.

The Bird Protection and Study Society of Serbia together with the Society of nature conservationists "Riparia" from Subotica, and many other citizens' associations is implementing the project for enhancing the population of European roller in Vojvodina. One of the main activties is supporting of nesting of European rollers with artificial nest boxes. That resulted in an increas of the population and in expanding of the breeding range of the species. For the purpose of long-term monitoring, locations of nest boxes are marked with a GPS device, the success of nesting is monitored, and the offspring is banded with regular and coloured markers.

Since 2001, the Institute for Nature Conservation of Serbia has been implementing active protection measures with the aim of conserving the only habitat of Venus hair fern *Adiantum capillus veneris* in Serbia. Captation of thermo-mineral water springs in Zvonce spa in 2001 disturbed the water regime and endangered the subsistence of Venus hair fern population. In the same year, the Institute initiated the protection of this location and set up a pipeline system for artificial watering. Today, this habitat is protected as the Venerina padina Special Nature Reserve, and regular expert monitoring and maintenance of watering system have enabled a significant increase in numbers of this population. In 2001, there were only about ten specimens of this plant on the location, and today this population occupies a space of almost 10 m^2.

Figure 5. Venus hair fern Adiantum capillus veneris

1.6. Overview of studies and data on ecosystem services in Serbia

Research and evaluation of ecosystem services in Serbia are underdeveloped and performed sporadically. Since this is a relatively new concept, the very term is still not clear enough and not accepted in wider public. A more detailed analysis of ecosystem services has not been performed for any areas. There is no system in place, nor a harmonised methodology of ecosystem services research.

Evaluation of ecosystem services in the National Park Kopaonik

Study on valuation of a part of ecosystem services provided by the National Park Kopaonik started at the end of 2013 and it includes valuation of wood resources and selected non-wood forest products. The evaluation of the wood mass is performed based on questionnaires and interviews performed with representatives of all larger sawmills on the territory of Raška municipality (where the largest portion of the wood mass is placed), including the data on wood mass that has been exported or distributed outside Raška municipality. The data relates to the period from 2005 to 2013. Basic implemented research methods are modelling and

mathematical-statistical method (descriptive statistics, regression and correlation analysis with the aim of determination of connectedness of studied elements). The value of the wood is assessed through the evaluation and prediction method (Keča, 2009), and correlation and regression analyses are used in order to increase accuracy of the evaluation (Ranković and Vučković, 2011). The implementation of the above-mentioned methods and analyses produces the value of wood mass for the main tree species at the National park Kopaonik.

In the other part of the research, which relates to the evaluation of non-wood forest products, the subject of the analysis (survey and interview methods) were the companies which deal with purchase, processing and placement of non-wood forest products from the territory of the municipalities of Raška, Brus, Novi Pazar and Aleksandrovac, i.e. the companies whose raw material basis is partly located in the territory of the national park. The questionnaire provided data on quantities of purchased blueberries, fungi and other forest fruit for the period between 2005 and 2013. According to the nature of the problems and the goal of the research, different general and specific scientific methods were implemented during the work, but the primary position is taken by the statistical method of trend analysis, with the implementation of regression and correlation analysis. The analysis of data and purchase price and placement of the above-mentioned non-wood forest products produces a model of value for this part of ecosystem services. All the described elements should provide information on quantity of purchased non-wood forest products from the national park's territory, achieved prices, differences between the domestic and the foreign market, the type of the most precious products, the strategies used for the promotion of products, i.e. they should create a complex image of potentials and possibilities for the use of such a source of income for financing of the national park's activities.

Benefits of ecosystem services of the Đerdap National Park for the local community

At the beginning of 2014, the realization of the project "Benefits of ecosystem services of the Đerdap National Park for the local community" started, as one of the segments of a wider project Bioregio Carpathians, which is financed from cross border cooperation program for the Southeastern Europe. The Institute for Nature Conservation of Serbia is implementing this project in partnership with the Đerdap National Park.
The general aim of the study "The Benefit of ecosystem services of the Đerdap National Park for the local community" is to enable the inclusion of the values of biodiversity and ecosystem services into the economic and developmental policy, planning and programs for the promotion of sustainable management of biodiversity and ecosystem services as a form of support to the economic growth.

The planned project activities include:

1. Analysis of the ecosystem of the area of the Đerdap National Park and Lower Danube in Serbia, which includes collection of data about types, structure and composition of ecosystem, together with an analysis of patterns for key ecosystems.
2. Historical and current socio-economic influences and impacts of the environment on ecosystems.
3. Identification of key ecosystem services and analysis of the legal framework for the protection of ecosystem services, together with the analysis of national and international legislation which is applicable to ecosystem services.

4. Definition and inclusion of key groups of stakeholders, with expert evaluations of their needs regarding ecosystems. The management practices applied so far which influence ecosystem services will also be analyzed and the disadvantages of the practice will be defined, in order to create a proposal for the measures for the improvement of functioning of the ecosystem services and the benefits which originate from them (at local, regional, national and international level).

The first steps regarding evaluations of ecosystem services in Serbia were made at the end of the nineties of the past century by the Institute of Economic Sciences, when preliminary analyses were made, as well as one study related to the evaluation of ecosystem services (Drašković, 1998). Some of the topics that were analysed in this paper, but only from a theoretic point of view, were: methods for the evaluation of natural capital, such as discount rate method, the analysis of costs and profit, Willingness To Pay (WTP). The price lists for the evaluation of all forms of utilization of natural capital, including indirect utilization – destruction of the environment, were not known at that time. "Benefit transfer" methodology for the evaluation of damage in the environment was mentioned in the National report on environmental services and financing of the protection and sustainable use of ecosystems (for Serbia and Montenegro), which has been prepared within the Convention on the Protection and Use of Transboundary Watercourses and International Lakes, and which was created by the then Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia in 2005[3].
In 2013, the Institute of Economic Sciences issued a publication as a result of the research related to the use and management of natural goods, values and capital of the protected areas in Serbia, based on the example of a chosen group of Special Nature Reserves (Drašković, 2013). The book was partly also a result of the research which was performed at the Institute of Economic Sciences within the project "Economic aspects of costs and benefits of environmental protection policy in Serbia". The research was realized in 2012, and the results which have been displayed in the book relate to the chosen special nature reserves of Zasavica, Uvac and Stari Begej-Carska Bara. The previous poll regarding the attitudes of the citizens towards natural goods and the values located in the Zasavica reserve were performed in 2008 and were used for the comparative analysis with the results of the research implemented in 2012.

The initiative "Local action planning for biodiversity in Southeastern Europe" and the implementation of the project "Biodiversity and ecosystem services for local sustainable development in Western Balkan countries", which were realized through a partnership of international organizations in the period between 2009 and 2013 (ECNC – European Centre for Nature Conservation and REC – Regional Environmental Centre), and financed by the Ministry for Foreign Affairs of Finland, were focused on the raising of awareness of the local population in relation to the needs for the preservation of biodiversity and the evaluation of ecosystem services. Within this project, local action plans were created for the biodiversity of municipalities of Čajetina, Bajina Bašta and Ljubovija (Jones-Walters, *et al.*, 2010). During the realization of the project, various stakeholders were included in order to collect and share the information related to local resources, the potential of biodiversity and ecosystem services which are used by the inhabitants of these rural municipalities. The results which were obtained by working with these municipalities represent a qualitative contribution and an indicator of the way in which the local population understands the importance of conservation

3 Seminar on environmental services and financing for the protection and sustainable use of ecosystems, Geneva, 10-11 October 2005

of biodiversity and evaluates the ecosystem services in its immediate environment. The representatives of municipal structures, including the decision-makers at the local level, were very interested in subsistence of their communities, due to several reasons which have been defined during the participative process:

- Ecosystems with large biodiversity provide services which bring health and wellbeing to the people;
- Such ecosystems are more resistant to various threats, natural disasters and invasive species;
- Various ecosystems enable:
    - Healthy food,
    - Medicinal herbs,
    - Fresh drinking water,
    - Water and air refinement,
    - Renewal after industrial accidents,
    - Decrease in costs for the preservation of human health,
    - Life with less risks,
    - Improvement of cultural and spiritual development and
    - Promotion of values which bring significant economic benefits, including the potential for the increase in the standard of living, with the aim of securing a healthier and cheaper living.

Within the " Promoting payments for ecosystem services and related sustainable financing schemes in the Danube basin" project, implemented by the WWF Danube-Carpathian programme with the financial support provided by the Global Environment Facility (GEF), through UNEP and the European Commission, an analysis of payments for ecosystem services and a feasibility study in Serbia was prepared (Sekulić, 2012). This publication provides a detailed overview of the existing financial schemes in relation to natural resources and nature.

Research, identification and framework evaluation of ecosystem services of Potamišje were performed in 2011 for one section of Tamiš, between Idvor and Opovo, which is 20 km long. Ecosystems of rivers, marshes and forests have been analyzed, and the values for ecosystem services have been derived based on 86 studies that have been taken from the database of the large global initiative "The Economics of Ecosystems and Biodiversity" (TEEB)[4]. The above-mentioned results represent only rough assessments, because obtaining the real value of ecosystem services requires performance of complex and long-term research. The obtained values of ecosystem services in this example are relatively high, mostly due to the large surface of the flood area.

The inclusion of Serbia into the Global Ecosystem Services Partnership (Serbian ecosystem services partnership SESP - http://www.es-partnership.org/esp/80133/5/0/50), was initiated in 2013, and it implies the establishment of the research of ecosystem services in Serbia. The aim of this partnership is to map and evaluate ecosystem services at the national level (Mapping and Assessing of ES - MAES). Serbian ecosystem services partnership represents a network of decision-makers and public institutions, managers of protected areas, non-governmental organizations, research institutes, faculties, citizens and other interested parties

[4] Ecosystem and biodiversity economy is a global initiative directed towards turning attention to economic benefits of biodiversity, including the growing costs due to the loss of biodiversity and degradation of ecosystems. TEEB represents the approach that could help decision-makers to recognize, display and accept the values of ecosystem services and biodiversity.

that wish to make a contribution to the expansion of the idea on the importance of ecosystem services and their inclusion in Serbia. The global ecosystem services partnership endeavours to create a platform for all interested parties which will start implementing the concept of ecosystem services in the process of development of the society, in order to achieve the benefits for people and the conservation of nature and biodiversity. Serbian ecosystem services partnership seeks to provide the framework and the tools which are required for the provision of sustainable management and use of land and natural resources; to protect and conserve nature and biodiversity and to educate decision-makers and wider public about the benefits provided by ecosystems in a society.

Within the "Dinaric Arc Parks" project, realized by the World Wildlife Fund (WWF) and financially supported by the Ministry for Foreign Affairts of Norway and the MAVA Foundation, during the period between 2012 and 2014, an evaluation of ecosystem values will be made following the Protected Areas Benefits Assessment Tool (PA BAT) methodology , i.e. the evaluation of the benefits of parks in 50 protected areas in the whole region, including Serbia, which represents a basis for further work on ecosystem services. The activities in Serbia relate to the preparation and nomination of two parks for the ECST (European Charter for Sustainable Tourism), and the implementation of PA BAT methodology is planned for 4 national parks (Kopaonik, Fruška Gora, Tara and Đerdap).

The first scientific review of values of ecosystem services in Serbia will be known after the publication of the first results of integral and interdisciplinary scientific research project financed by the Ministry of Education and Science of the Republic of Serbia, which is jointly realized by the Faculty of Biology and the Faculty of Agriculture of Belgrade University. The name of the project is "Agrobiodiversity and use of land in Serbia: an integrated evaluation of biodiversity of key functional groups of invertebrate and plant pathogens", and its realization was started in 2011. The project represents an integrated approach to evaluation and monitoring of the state of agrobiodiversity in Serbia in relation to the appropriate influences on the environment (especially on changes in the use of space) and the related fall of biological diversity.

1.7. Natural resources and well-being of people in Serbia

This report shows the statistical data related to the changes in trends in the last five years (2008-2012), which relate to basic resources of natural systems in Serbia – land, agricultural and forest resources.

The volume of use of available resources depends on their size and availability, the degree to which the society is developed and the population size in a defined territory. For the display of resource capacities in Serbia, in relation to the population size, this report used the data obtained on the basis of the census and the data taken from the Statistical annual reports of the Statistical Office of the Republic of Serbia. The basic analysis of natural resources which influence the human well-being in Serbia has been displayed, by using the principle which was represented in the Environmental Indicator Report of the European Environment Agency for 2013. Figure 6 shows the connection between the resources and the influence of the complete environmental system on human health and well-being.

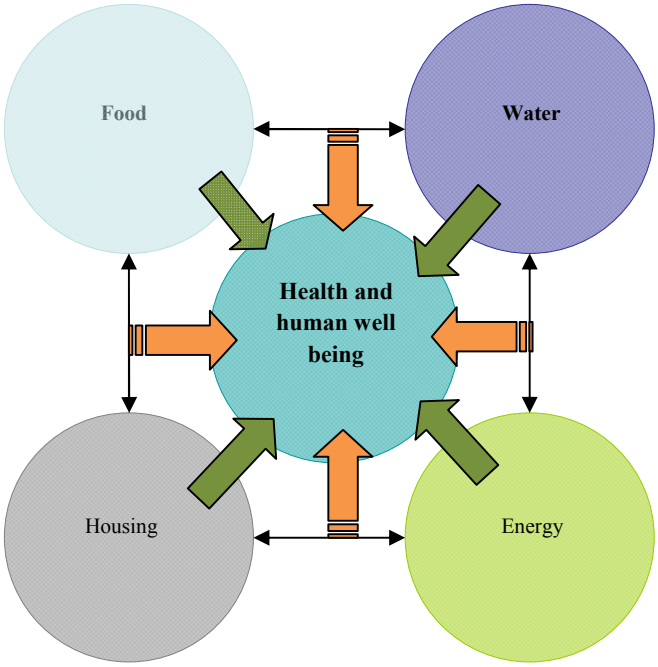


Figure 6. Key resources of natural systems and human well-being[5]

Resources which are required for the consumption (for example freely available services)

Approach and exposure to the environment (for example regulatory and cultural services)

Relationships between used resources (for example water which is necessary for food production)

[5] Modified in accordance with: Environmental indicator report 2013 - Natural resources and human well-being in a green economy, EEA 2013

The only existing system in Serbia, which is related to the payment for use of natural resources, is the system of compensations for use of natural assets, including fees for use of protected areas, which has been established on the basis of various legal acts. The Constitution of the Republic of Serbia ("The Official Gazette of the Republic of Serbia", No. 98/2006, Article 87) determines that natural assets, as well as goods which the law prescribes as goods of general interest, represent state property and are used under the conditions and in the manner prescribed by the law.
In 2011, the Standing Conference of Towns and Municipalities (SCTM), with a support of Swiss Agency for Cooperation and Development (SDC) and German Agency for International Cooperation (GIZ) created a study named "System of compensations for use of natural riches and allocation of income between central and regional level of authorities", within the projects "Institutional support to SCTM" and "Support of reforms of the public finance system in Serbia". This study represents and considers the system of compensations and the legal framework for use of natural riches in Serbia, manner of allocation of income from compensations between different levels of executive authorities, and especially between the Republic and the units of local self-government, and proposal of changes of appropriate regulations from the standpoint of competence for introduction and control, as well as affiliation of income to different levels of executive authority. The research also considers the fiscal nature of the existing compensations, i.e. it was established for each individually analysed compensation, whether it is compensation in form of a price for use of a natural good or it is a tax, i.e. public charge which is being paid independently from the use of a good.

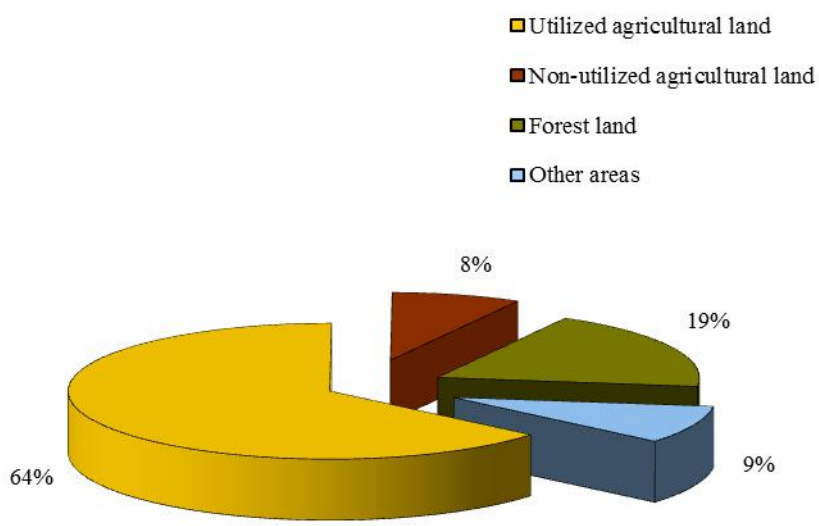
1.7.1. Agricultural land

According to the results of the latest agricultural inventory in 2012, Serbia has 5 346 596 hectares of total available agricultural land, which represents 60% of the national territory and provides ecosystem services of vital importance for human well-being and health. Of the above-mentioned surface, the utilized agricultural land stretches over the territory of 3 437 423 hectares. The data in the Table 5 represent the allocation of the total available and utilized agricultural land.

Table 5. Total available and utilized agricultural land. Source: Agricultural census, 2012

Total available land	Utilized agricultural land	Non-utilized agricultural land	Forest land	Other land
5 346 596	3 437 423	424 054	1 023 035	462 083
%	64.29	7.93	19.13	8.65

Figure 7. Ratio of different types of used land in comparison with the total available land



More than 70% of the utilized agricultural land is arable land, whereas meadows and pastures represent one fifth of the utilized arable land.

Table 6. Utilized agricultural land. Source: Agricultural census, 2012

Utilized agricultural land	Gardens and infields	Arable land	Meadows and pastures	Permanent plantations/crops
3 437 423	23 727	2 513 154	713 242	187 299
%	0.69	73.11	20.75	5.45

1.7.2. Allocation of agricultural land

In 2003, Serbia had a total of 5 115 000 hectares of agricultural land, of which the largest percentage was occupied by arable fields and gardens (65%), while meadows and pastures were represented with 27.8%. During the ten-year period, a decrease in the surface of the total agricultural land has been identified, but the arable fields and gardens have always been represented with about 65%, whereas the surface under meadows and pastures has increased and in 2008, it represented 28.5% of the total agricultural land, and almost 30% in 2012. Fishponds, reedbeds and swamps occupied only about 0.8% of the total agricultural land. The remainder was occupied by orchards and vineyards (about 6%).

During the ten-year period, there was a constant decrease in the surface of agricultural land, which is a consequence of conversion of this land into construction and industrial land. In 2012, the total agricultural land decreased by 0.4% in comparison with 2008, and by 0.6% in comparison with 2003.

Figure 8. Trend in surface of utilized arable area in the period 2008-2012 (per 1000 hectares). Source: The Statistical Office of the Republic of Serbia

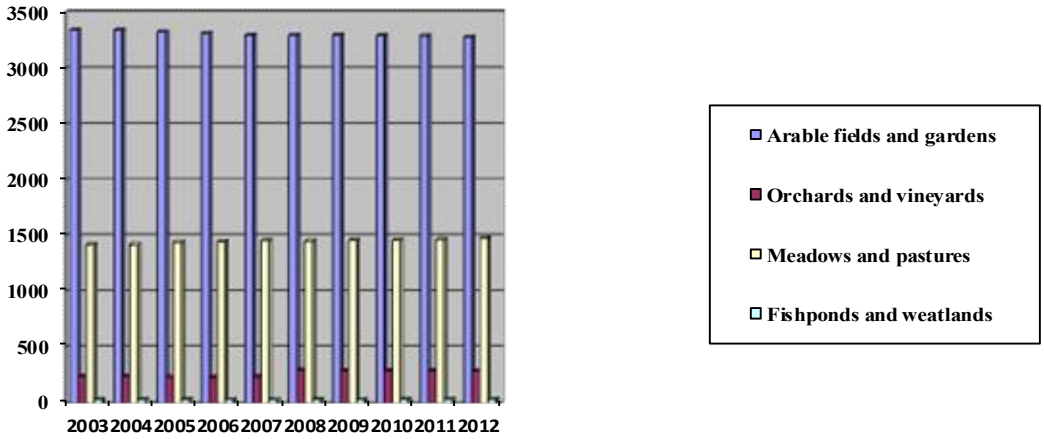
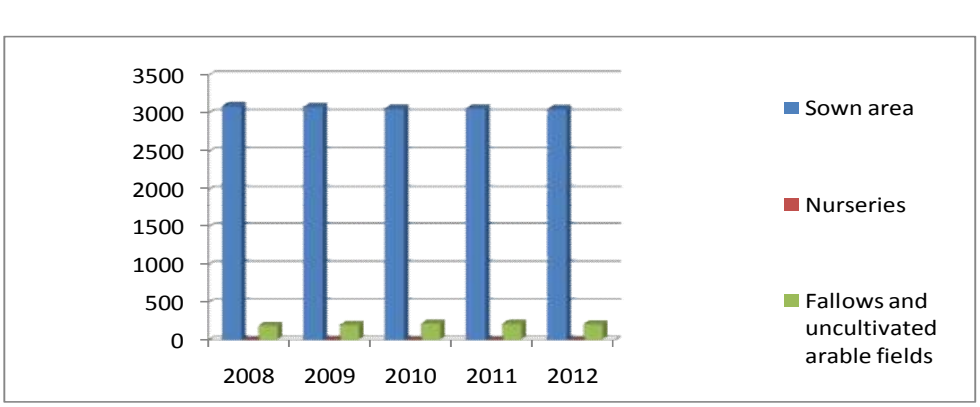


Table 7. Trend of selected crops during the period 2008-2012. Source: Republic Institute of Statistics

Year	Arable fields and gardens	Sown area					Nurseries	Fallows and uncultivated arable fields
		Total	Cereals	Industrial crops	Vegetable crops	Fodder crops		
2008	3302	3099	1937	416	281	466	1	199
2009	3301	3089	1956	403	276	455	2	209
2010	3295	3066	1894	439	273	460	1	226
2011	3294	3067	1911	429	272	455	1	224
2012	3282	3060	1919	421	264	456	1	219

The table shows the trend of used arable fields during the period 2008-2012. The trend of decrease in total sown surface is also observed, so in 2012, 1.26% percent less was sown than in 2008, whereas the surface under fallows and uncultivated arable fields increased during the same period by 9% (Figure 9)

Figure 9. Five-year trend in total sown area, nurseries and fallows and uncultivated arable fields. Source: The Statistical Office of the Republic of Serbia



1.7.3. National agri-environment programme

During the period from 2008 to 2012, no significant changes in the utilization of agricultural surfaces have been noticed, except for the decrease in total agricultural surfaces which has been registered. In historical terms, agriculture has always been the most important sector of Serbian economy. The structure of the agricultural sector in Serbia was transformed during the nineties and at the beginning of 2000s through the privatization of public farms, when large investors appeared in the role of new owners of agricultural land, especially in Vojvodina. Since that period of time, intense change of allocation of space from agricultural to industrial and construction land started. During 2009 and 2010, a project for the development of national agri-environment programme for Serbia was realized, and within that project were defined types of agricultural systems in Serbia with the highest possibility to be marked as systems of high natural value and importance to conservation of biodiversity. Such systems are characterized by low-intensity use of land, presence of semi-natural vegetation and natural and semi-natural area landscape characteristics, as well as the diversity of land cover and the use of land. Through this project, ten examples of low-intensity cattle breeding systems were singled out, agricultural land of high natural value were mapped and preliminary data were obtained that about 1 187 200 ha in Serbia belongs to the land of high natural value, which represents 13% of the total territory of Serbia, i.e. 19% of the total agricultural area, although it is presumed that a more detailed analysis would show even higher percentages. Two case studies have also been performed on agricultural systems of high natural value – at Stara planina and Deliblato sands.

Incentives for sustainable rural development

According to the Decree on the allocation of incentives in agriculture and rural development in 2013 ("Official Gazette of RS", No. 20/13), the scope of funds for the incitement of measures for rural development amounted to about 10 458 450 EUR, and the incentive for sustainable rural development amounted to about 1 913 943 EUR, namely for:

(1) Organic production in the amount of EUR 1 739 130,

(2) Conservation of plant and animal genetic resources in the amount of EUR 173 193, of which the amount of EUR 86 956 has been intended for the conservation of plant genetic resources, and the amount of EUR 86 956 has been envisaged for conservation of animal genetic resources;

Based on the Decree on the allocation of incentives in agriculture and rural development in 2014 ("Official Gazette of RS", No. 8/14), the scope of assets for the incentives for measures regarding rural development amounted to about 8 307 826, and the incentives for sustainable rural development amounted to about EUR 1 076 086, namely for:

(1) Organic production in the amount of EUR 815 217,

(2) conservation of plant and animal genetic resources in the amount of EUR 260 869, of which the amount of EUR 43 478 has been intended for conservation of plant genetic resources, and the amount of EUR 217 391 has been envisaged for conservation of animal genetic resources.

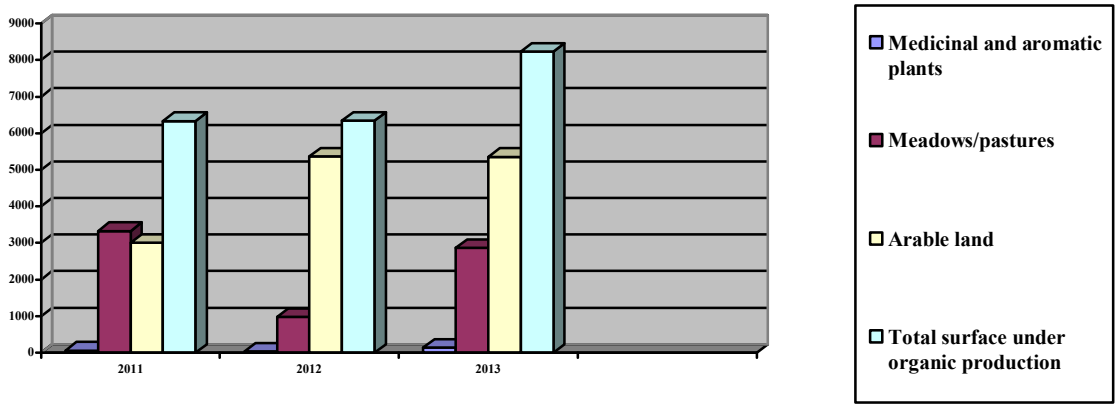
1.7.4. Organic production

According to the data of the Serbian Chamber of Commerce, organic production is currently being performed on surface of 7 500 ha, regardless of whether these are products that have already been certified or they are products which are in the process of obtaining a certificate for organic products. The above-mentioned number of hectares does not include surfaces which are utilized for the collection of forest fruits, mushrooms and medicinal herbs, because there is no official methodology in Serbia based on which data on the total surface on which the collection of wild plant species is being collected from their natural habitats can be obtained.

Table 8. Structure of surfaces per categories of organic plant production. Source: The Ministry of Agriculture and Environmental Protection, Department for Organic Production

ORGANIC PLANT PRODUCTION IN THE REPUBLIC OF SERBIA (ha)									
Year	2011			2012			2013		
Status	Conversion period	Organic status	Total	Conversion period	Organic status	Total	Conversion period	Organic status	Total
Medicinal and aromatic plants	17.37	42.09	59.46	1.56	26.84	28.40	26.72	105.93	132.65
Meadows/ pastures	1 562.17	1 765.32	3 327.49	779.83	196.08	975.91	2 220.76	651.98	2 872.74
Arable land	2 155.82	851.82	3 007.64	3 475.48	1 888.71	5 364.19	2 820.43	2 534.83	5 355.25
Total surface under organic production	**3 717.99**	**2 617.14**	**6 335.14**	**4 255.31**	**2 084.79**	**6 341.00**	**5 041.18**	**3 186.81**	**8 228.00**

Figure 10. Total land under organic production in the period 2011-2013. Source: The Ministry of Agriculture and Environmental Protection, Department for Organic Production



In the period 2011-2013, a decrease in the surfaces under meadows and pastures has been recorded, and it was 70% less in 2012 than in 2011, whereas an increase of 66% was recorded in 2013 in comparison to the previous year. All other categories recorded an increase in

surfaces under organically cultivated plants, so in general, organic production in Serbia is on the increase (for about 20% in 2013 in comparison with the previous period), which is particularly evident in the increase in arable surfaces.

1.7.5. Fish stocks

Waters of all three basins of Serbia are inhabited with a total number of 98 fish and ciclostomata species (4 ciclostomata species and 94 fish species) from 23 fish families (Mijović *et al.,* 2012), which amounts to about a third of the total number of freshwater fish species in Europe (10 ciclostomata species and 306 fish species from 33 families) (Maitland, 2000).

Of the total number of fish which inhabit Serbian waters, about 50 species are subjected to economic and recreational fishing. From the standpoint of economic fishing, 29 fish species have larger or smaller economic significance, of which 12 species represent the target group which is predominantly caught. Other species represent an accompanying and occasional catch and are of secondary economic importance. Recreational fishing encompasses about 45 species, but in this case, about 50% of this number represents a target group (Živković e*t al.,* 2011).

The management of fish stocks in fishing waters, which includes the protection and sustainable use of fish stocks as a natural resource and the goods of general interest, is regulated by the Law on the Conservation and Sustainable Utilization of Fish Stocks ("The Official Gazette of the Republic of Serbia", No. 36/2009). The management of fishing resources is performed in conformity with the principle of sustainable use, which contributes to the conservation of ichtiofauna diversity and ecological integrity of aquatic ecosystems. The fish stocks in fishing waters, according to this Law, represent a state property.

Fishing in rivers, lakes and accumulations

Users of fishing areas deliver the data on utilization of fish stocks, which they obtain during the management of a fishing area, and which relate to the number of issued licenses for economic and/or recreational fishing, as well as the register of the catch and the structure of the catch, to the Environmental Agency, which establishes and manages an information system for the conservation of the environment.

Based on the data of the Statistical Office of the Republic of Serbia, which keeps records on the number of fishing guards in fishing waters and the number of issued licenses for professional and sports-recreational fishing, it is concluded that in the analysed period from 2008 to 2012, the number of fishing guards varies and ranges from 190 to 253, that there is a trend of a decrease in the number of licenses for professional fishing since 2009, and that the number of issued licenses for sports and recreational fishing increased by 20-25% in 2009 in comparison with the other analysed years (Figures 11 and 12).

Figure 11. Number of fishing guards and professional fishermen for the period 2008-2012

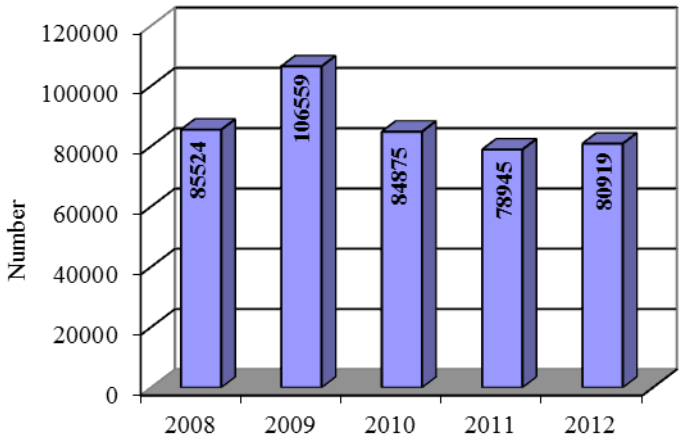


Figure 12. The number of issued licenses for sports and recreational fishing

The total fish catch is monitored based on the data delivered from professional and recreational-sports fishing (Figures 13 and 14). The total fish catch has increased in the period 2008-2011, but in 2012 a decrease of 10% in the quantity of caught fish occurred in comparison with the previous year. The largest quantity of fish caught in professional and sports-recreational fishing was recorded in 2011. In the period from 2009 to 2010, an opposite trend in the quantity of caught fish was recorded in professional and sports-recreational fishing. The fish catch in professional fishing slightly decreased, whereas almost 40% more fish was caught in sports-recreational fishing in 2010 in comparison with 2009.

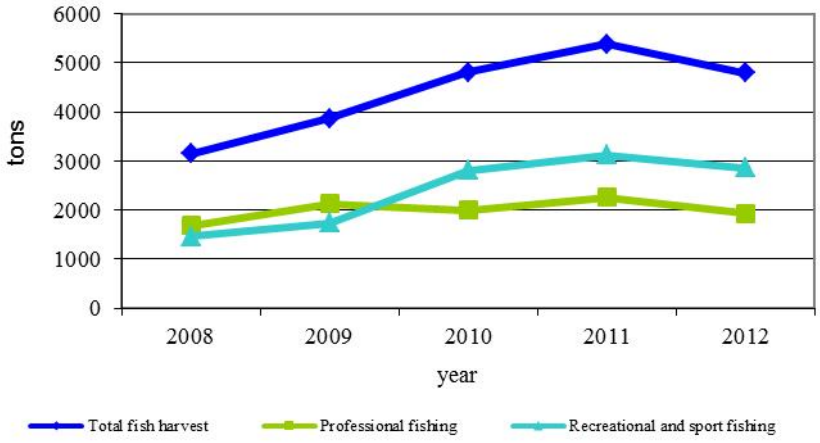


Figure 13. Fish caught through professional and recreational/sport fishing

In comparison with the fishing of individual fish species in the period from 2008 to 2012, the most caught species was Prussian carp, followed by Bream and Carp, whereas Silver carp catch was smaller.

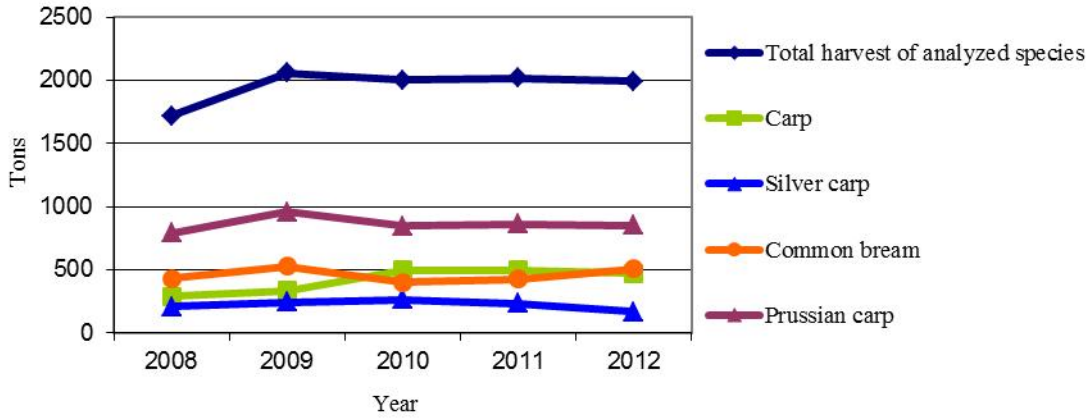


Figure 14. Catch of analysed fish species

1.7.6. Forest ecosystems

According to the data of the National Forest Inventory (Banković *et al.,* 2009), where the last all-encompassing evaluation of forest resources was made, Serbia belongs to the category of countries with a medium amount of forests; of the total territory of Serbia, 29.1% is under forests (37.6% in central Serbia and 7.1% in Vojvodina). Other forest land which implies thickets and shrubberies according to the international definition, encompasses 4.9%. In relation to the reference year of 1979, increase of surface covered with forests is 5.2%. The reasons behind such situation are regular aforestation planning operations, but also the fact that there is a trend of a decrease in the number of inhabitants of rural areas, especially in highland areas, which lead to dying out and cessation of extensive agrarian production in that regions. Another reason why the data should be taken with caution is an irregular update of the cadastre, especially when it comes to the land use.

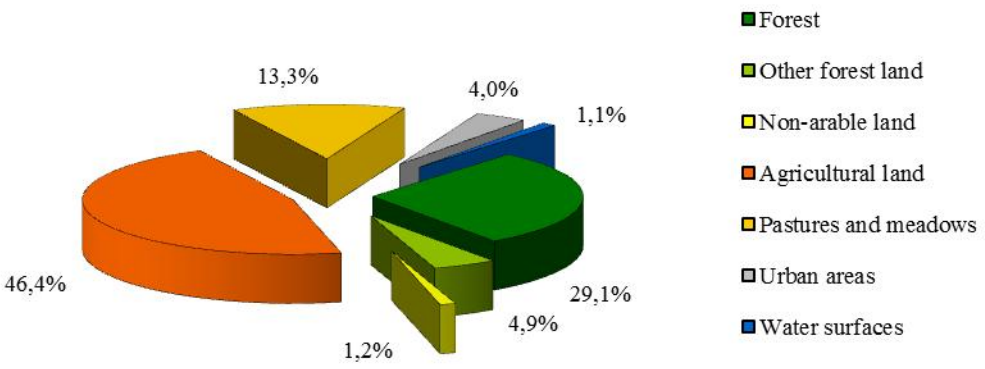


Figure 15. Structure of services according to type of land use

In relation to the number of citizens, forestation amounts to 0.3 ha per citizen, which is a lower rate than in other regional countries (in Bosnia and Herzegovina it is 1.38 ha, in Croatia it is 1.25 ha, in Bulgaria 1.31 ha).

In relation to the total grown surface, the forest resources of Serbia is dominated by coppice forests with 64.7%, natural stands of trees of high origin cover 27.5% of the territory, whereas artificially erected stands stretch over 7.8%. The average forest density in Serbia is 939 trunks per hectare, whereat in tall natural forests the average density amounts to 596 trunks per hectare. The total forest surface in Serbia amounts to 2252400 ha, of which 53% represents a public property, and 47% represents private property. There is a total number of 49 tree species, of which 40 are deciduous species, and 9 are coniferous species. An unbalanced presence of recorded tree species has been observed in the total forest stock. Serbian forests are dominated by beech, which is represented with 40.5% in the total volume, whereas spruce with participation in the total volume of 5.2% and pines with participation of 4.5% are the most represented coniferous species.

An indicator of naturalness is a significant indicator of bioecological stability and conserved biodiversity in the evaluated spatial units. The largest percentage of forests in Serbia belongs to semi-natural forests (92.1%), plantations are represented with 7.8%, whereas only 0.1% of forests did not encounter human intervention.

Tall natural forest stands

From the standpoint of biodiversity and ecosystem services, tall natural stands have the highest importance.

In forests of natural origin, 38 tree species have been recorded, of which two are allochthonous. The most represented species is beech with a share of 57.1% in the total volume. Other species have an individual participation in the forest stock of less than 10%, whereas only ten species are present with more than 1%. Table 9 shows the state of tall natural forests per their stand affiliation. Black locust and Douglas fir have been entered and, according to the national forest inventory, these two species are present in low numbers.

Table 9. State of tall natural forests per stand affiliation.
Source: National Forest Inventory, 2009

Stand affiliation	**Surface**	
	ha	%
Beech forests	350 800	56.5
Spruce forests	54 000	8.7
Pedunculate oak forests	28 800	4.6
For tree forests	24 400	3.9
Sessile oak forests	44 800	7.2
Pine forests	40 000	6.4
Turkey oak forests	19 600	3.2
Narrow-leaved ash forests	12 800	2.1
Hungarian oak forests	18 000	2.9
Birch. poplar and black locust forests	18 400	3.0

Hornbeam forests	5 200	0.8
Ash and maple forests	4 400	0.7
TOTAL	621 200	100

The total surface of preserved forests in Serbia amounts to 70.6%, with a density of 1 222 trunks per hectare. However, one of the basic problems with which forests of natural origin encounter in Serbia is the mediocre level of conservation, which is, above all, stated in relation to the degree in which stands are grown. Tall forest stands record a mediocre state of forests in relation to their conservation, so the tall preserved stands cover 54.3% of the total grown surface. Table 10 displays the state of tall natural forests per their degree of preservation.

Table 10. State of tall natural forests per degree of their preservation.
Source: National Forest Inventory, 2009

Preservation of stands	**Surface**	
	ha	%
Preserved stands	337 200	54.3
Diluted stands	267 600	43.1
Devastated stands	16 400	2.6
TOTAL	621 200	100

Table 11 shows the state of tall natural forests per their mixed character. Purely deciduous stands are the most represented type, with more than 60%, and mixed coniferous stands are the least represented with 1.5%.

Table 11: State of tall natural forests per their mixed character.
Source: National Forest Inventory, 2009

Mixed character of stands	**Surface**	
	Ha	%
Purely deciduous stands	400 400	64.5
Purely coniferous stands	91 200	14.7
Mixed deciduous stands	91 600	14.7
Mixed deciduous and coniferous stands	28 800	4.6
Mixed coniferous stands	9 200	1.5
TOTAL	621 200	100

Deadwood

A significant indicator of the state of forests and attitude toward the principle of sustainable management is the quantity of deadwoodin Serbian forests. The total volume of dead trees in Serbian forests amounts to 16 260 414 m^3, average timber volume of dry tree trunks is 4.05 m^3 per hectare, the volume of dry cut down trees amounts to 3.17 m^3 per hectare, i.e. the total concentration of dead trees in Serbia amounts to 7.22 m^3 per hectare and it is higher in Vojvodina (7.75 m^3 per hectare) than in Central Serbia (7.18 m^3 per hectare). The required norm amounts to 2-3 m^3 per hectare. This quantity of deadwood enables the sustainability of the habitat, which has a special significance for entomofauna and ornithofauna with which forests are inhabited and whose habitats are small pieces of deadwoodof certain species. At

the same time, disposal of one part of the yield in a forest represents a significant renewable resource in relation to the need of preserving production potential of the complete habitat.

Table 12: Deadwood. Source: National Forest Inventory, 2009

Health state of trunks	Number of trunks		Volume	
	Units	%	m^3	%
Dry (dead) cut down trunk	79 283 641	78.5	9 113 109.8	56.1
Dry (dead) horizontal trunk	14 911 956	14.8	3 617 080.7	22.2
Part of the horizontal trunk	6 791 765	6.7	3 530 223.7	21.7
Total	100 987 362	100	16 260 414.2	100

1.7.7. Ecosystem services – forest ecosystems

Carbon reserves in Serbian forests

Forest ecosystems provide a large number of services. Together with the soil, forest ecosystems have a large capacity for the accumulation and release of carbon. Climate change influence the forest ecosystems, in the sense of disturbance of carbon balance. Carbon reserves in the tree volume of forest ecosystems in Serbia depend on the forest origin. Table 13 shows the carbon reserves in relation to the origin of forests.

Table 13. Carbon reserves in relation to the origin of forests. Source: National Forest Inventory, 2009

Origin of forests	Surface	Volume	Carbon
	ha	m^3	t
Tall natural stands	621 200	157 511 262.8	50 411 688.6
Coppice forests	1 456 400	181 188 914.2	63 733 764.2
Artificially created stands	174 800	23 787 240.6	6 091 897.6
Total	2 252 400	362 487 417.6	120 237 350.4

The quantity of carbon which remains in forest ecosystems is conditioned by numerous factors, but the most important factors are those which influence the increment of biomass, such as the following: change in surfaces covered by forests, commercial harvest, forest fires, weather extremes, air pollution, change of conditions in soil, erosion, presence and number of pests, and other. Conservation of carbon which has been accumulated in the existing forests and reduction of emissions represent the basic principles of contemporary forest management, with the aim of mitigation of consequences of climate change at the local level as well. In relation to the total surface covered in forests, carbon reserves amount to 53.38 tons per hectare. According to the data of the National Forest Inventory, beech forests and oak forests, as forests with the largest presence in Serbia, also possess the largest carbon reserves (Table 14).

Table 14. Carbon reserves in relation to the type of forest.
Source: National Forest Inventory, 2009

Type of trees	Volume	Carbon
	m^3	Tons
Beech	146 850 828	50 663 535.6
Pedunculate oak	9 242 373	2 865 135.6
Sessile oak	21 542 890	7 109 153.7
Hornbeam	15 157 240	5 982 645.1
Turkey oak	46 980 446	18 322 373.9
Hungarian oak	20 986 465	7 030 465.8
Silver lime	1 779 096	435 755.5
Black locust	11 243 944	4 160 259.1
EU poplar	6 137 862	1 288 951.1
Spruce	18 810 547	4 015 583.1
Fir tree	8 304 924	1 702 509.3
White and black pine	16 434 457	4 765 992.4
TOTAL	323 471 072	108 342 360.2

Basic indicators of forestry

The average wood mass in forests was smaller in 2012 in comparison with 2011, and it amounted to 2 609 thousand m^3. In the public sector, wood mass of 2 074 thousand m^3 was logged, which is more than the amount of logging in the private sector, and it amounts to about 79% of the total logged wood mass. In forests with pure stands, a wood mass of 1 866 000 m^3 was cut down, and the wood mass of 743 000 m^3 was cut down in forests with mixed stands. When it comes to purely deciduous and coniferous stands, 1 725 000 m^3 of purely deciduous stands was cut down, i.e. 141 000 m^3 of purely coniferous stands.

Artificial aforestation was lesser in 2012 than in 2011, namely by 686 ha, which represents a decrease of about 24% in comparison with the previous year. The total afforested surface in 2012 amounts to 2 135 ha. The surface afforested with coniferous species amounts to 869 ha, which represents about 41% of the total afforested surface in 2012. In the public sector, 1 541 ha was afforested, and 594 ha of land were afforested in the private sector.

Damages caused by fires in 2012 were recorded on the surface of 7 460 ha, with 63 118 m^3 of damaged wood mass.

Tables 15 and 16 show basic indicators of forestry in Serbia for the period 2008-2012.

Table 15. Cut forest mass in thousands of m^3.
Source: the Statistical Office of the Republic of Serbia

Year	Total	State forests	Private forests
2008	2578	1913	665
2009	2574	1978	596
2010	2668	1998	670
2011	2806	2136	670
2012	2609	2074	535

Table 16. Artificial aforestation (ha). Source: the Statistical Office of the Republic of Serbia

	Regular			Plantation
	Total	**Coniferous trees**	**Deciduous trees**	
2008	3320	1356	1964	8014
2009	2143	1357	786	923
2010	2204	1120	1084	5239
2011	2821	1117	1704	6547
2012	2135	869	1266	866

For the quantification of the benefit to human utilization, the wood mass which includes cut down industrial, technical, fuel wood and all produced forest assortments and total waste, is used.

The table shows production and sale of forest assortments per individual categories, for the period from 2008 to 2012. Within the sale of forest assortments, the largest percentage is taken by fuel wood, whose share ranged from 40% in 2008 up to 50% in 2012.

Table 17. Sale of forest assortments 2008-2012, state forests in thousands of m^3. Source: the Statistical office of the Republic of Serbia

	Total	**Logs for cutting**			**Mining wood**	**Cellulose wood**	**Fuel wood**	**Other wood**	**Production of assortments**
year		oak	beech	Coniferous trees					
2008	1957	24	265	136	60	108	795	569	1856
2009	1719	25	235	120	43	96	785	415	1771
2010	1871	24	243	119	20	101	928	436	1858
2011	1830	29	253	126	32	57	867	466	1935
2012	1936	28	248	133	41	69	999	418	1882

Table 18. Wood harvest in deciduous forests and outside forests in thousands of m^3. Source: the Statistical office of the Republic of Serbia

	Deciduous trees						
	Total deciduous and coniferous trees	**Total**	**Oak**	**Beech**	**Other hard wood**	**Poplar**	**Other soft wood**
2008	2609	2286	356	1182	300	323	125
2009	2603	2347	380	1280	178	439	70
2010	2696	2409	338	1227	387	366	91
2011	2833	2563	400	1420	180	500	63
2012	2636	2344	337	1209	281	410	107

In deciduous forests, the most intense harvest is beech harvest (a share of about 45% in harvested wood mass) and oak harvest (about 14%), i.e. poplar (13-17%), whose biomass is the largest and whose value and utilization are the highest. Soft wood, with the exception of poplar, was the least harvested, and has a share of only about 5% in the harvested wood mass.

Table 18. Wood harvest in coniferous forests and outside forests in thousands of m^3
Source: the Statistical office of the Republic of Serbia

Coniferous trees					
Year	**Total deciduous and coniferous trees**	**Total**	**Fir and spruce**	**Pine**	**Other**
2008	2609	323	186	102	35
2009	2603	256	165	82	9
2010	2696	287	184	94	9
2011	2833	270	180	83	7
2012	2636	292	185	97	10

In coniferous forests, the most intense harvest is the harvest of fir and spruce, harvest of pine is smaller, but the total harvest of coniferous trees is slightly lesser in comparison with the harvest of deciduous trees and it ranges from about 11%-13%.

Anti-erosion protection: according to the National Forest Inventory, various forms of erosion endanger about 90% of the surface of the territory of the Republic of Serbia, of which the first three categories are the most dangerous ones and about 36% of the territory of the Republic of Serbia belongs to the above-mentioned categories (I category excessive erosion – 2,888km^2, II category strong erosion – 9,138 km^2, III category medium erosion – 1,386 km^2). Excessive erosion is particularly prominent in the basins of the Južna Morava, the Beli Drim and the Pčinja rivers, whereas strong erosion is represented in more basins, especially in the basins of the, Pčinja, the Lepenac, the Zapadna and Južna Morava rivers.

Anti-erosion protection and landscaping of basins are implemented as a part of measures for integral utilization, landscaping and timely protection of accumulations from filling with deposits. In conformity with the strategy for transforming the so-far utilized agricultural land of lower creditworthiness into quality forests, biological measures of protection represent a priority – aforestation, renewal of degraded forests, grass sodding and melioration of pastures. The goal is, by implementing anti-erosion protection measures, to create conditions in which the systems provide stable income which further secures regular maintenance.

1.7.8. Collection of wild species from nature

Collection of medicinal herbs and forest fruits in Serbia represents one of the traditional manners of provision of income for households in rural areas. Cultivated surfaces with medicinal herbs are predominantly located in Vojvodina.

The beginning of active protection of biodiversity, when it comes to the collection of medicinal plants and forest fruits from nature, can be traced back to 1990, when lists of species which had to be reported and for whose trade compensations had to be paid, were created. The Law on Environmental Protection ("Official Gazette of RS", No. 66/91), within the section related to the protection of plant and animal species, elaborated on manners and

conditions for the collection from nature. Based on the above-mentioned Law, in 1993, a Decree on the control of the utilization and trade in wild plant and animal species ("Official Gazette of RS", No. 50/93, 16/96, 17/99) was enacted. The list included 81 plant species, 10 fungi species and 6 animal species. Pursuant to the new Law on Environmental Protection, the Decree on the control of the utilization of wild flora and fauna ("Official Gazette of RS", 31/05, 22/07, 38/08, 9/10, 69/11) was enacted. In time, the lists were changed, so the protection regime for certain species was changed. Some species were not included in the trade (because there was no interest in trading with these species, as was the case with the feral pigeon - *Columba livia domestica*, or because some species were not endangered by exploitation and had no similarities with the endangered or vulnerable species for which they could be mistaken). Currently, 63 plant species, 10 lichen species, 15 fungi species and 9 animal species are under control.

The collection from nature is performed by business entities which are registered for that activity. In the territory of the Republic of Serbia, according to the records of the Institute for Nature Conservation and Serbian Chamber of Commerce, there are about 200-300 business entities which deal with trade and processing of wild species. The analysis shows that most of them export raw materials, and only a small number of them processes the raw materials into semi-finished products, whereas even smaller number processes them into finished products which are further exported. These are mostly producers of teas and food, juices, jams and other confectionery products.

An analysis of the data of the Institute for Nature Conservation of Serbia shows that collection varies per years and that it primarily depends on the demand from abroad. By observing the period from 2011 to 2013, a decrease of interest in many plant species can be seen, as well as a decrease in number of business entities which dealt with this activity.

The situation regarding fungi trade is slightly more stable, there are always the same entities and they mostly demand similar quantities for export, which speaks of the fact that this part of the activity is more reliable regarding placement and it relies on multiannual contracts

Trade with snails decreased in 2012 in comparison with the quota, due to economic and financial situation of the companies which deal in this trade.

A special form of protection is related to species which can be endangered because of excessive and uncontrolled collection from nature. For example "comb picking" of blueberry, which is often encountered in practice, leads to the destruction of habitus, gradual decrease and drying of blueberry bushes. For animal species to which the prohibition of collection for a determined period of time relates, in conformity with the Law on Nature Conservation and the Rules on the proclamation and protection of strictly protected and protected wild plant, animal and fungi species, the amount of collected quantity was stated as 0 in Table 20.

Observed as a whole, the pressure exerted on this natural resource based on the collection activity is variable and does not even come near the high degree of endangerment of species in nature. The pressure exerted on the species within this activity is exerted only on those species whose root is used. A recommendation for these species is to cultivate them on plantations.

Table 19. The most collected plant species in Serbia in the period between 2011 and 2013 (kg of fresh mass). Source: Institute for Nature Conservation of Serbia

Species	Collected part	2011		2012		2013	
		Quota (kg)	Collected (kg)	Quota (kg)	Collected (kg)	Quota (kg)	Collected (kg)
Allium ursinum	herba	500000	327000	500000	350000	500000	484320
Fragaria vesca	fructus	300000	161000	300000	124818	300000	134700
Althaea officinalis	radix	150000	22620	150000	35280	150000	35850
Juniperus communis	fructus	2000000	1011165	2000000	406025	2000000	316150
Rosa canina.	fructus	5000000	1629570	5000000	1011010	5000000	2250060
Crategus monogyna	flos	220000	7000	220000	30950	220000	26150
Cornus mas	fructus	200000	31250	200000	18250	200000	22100
Vaccinium myrtillus	fructus	3000000	2270500	3000000	1433500	3000000	1649050

Table 20. Quota and collected quantities of lichen, fungi and wild animal species in the period between 2011 and 2013. Source: Institute for Nature Conservation of Serbia

Species	2011		2012		2013	
	Quota (kg)	Collected (kg)	Quota (kg)	Collected (kg)	Quota (kg)	Collected (kg)
Usnea barbata	100	0	100	0	100	0
Evernia prunastri	200	20	200	20	200	20
Cetraria islandica	100	0	100	34	100	38
Boletus aereus	10000	0	10000	4000	10000	0
Boletus reticulatus	4000	0	4000	0	4000	0
Boletus edulis	5000000	1976518	5000000	1326000	5000000	1891350
Boletus pinophilus	4000	1000	4000	0	4000	0
Cantharellus cibarius	1800000	903717	1800000	582000	1800000	409700
Craterellus cornucopioides	500000	21000	500000	11000	500000	9000
Lactarius delicious	150000	100000	150000	12000	150000	99500
Lactarius deterrimus	30000	0	30000	0	30000	0
Lactarius salmonicolor	30000	0	30000	0	30000	0
Lactarius sanguifluus	10000	0	10000	0	10000	0
Lactarius semisanguifluus	10000	0	10000	0	10000	0
Marasmius oreades	50000	500	50000	500	50000	1000
Tuber magnatum	30	5	30	14	30	31
Tuber aestivum	200	35	200	30	200	40
Tuber macrosporum	100	5	100	0	100	6
Vipera ammodytes	0	0	0	0	0	0
Pelophylax kl. *esculenta*	5000	0	5000	2000	5000	0
Pelophylax lessonae	5000	0	5000	2000	5000	0
Pelophylax ridibunus	5000	0	5000	2000	5000	0
Helix aspersa	200000	110000	200000	80000	200000	80000
Helix leucorum	200000	110000	200000	131500	200000	101000
Helix pomatia	800000	491000	800000	318000	800000	415000
Hirudo medicinalis	500	225	0	0	0	0
Testudo hermani	0	0	0	0	0	0

**Note: For the species to which the prohibition of collection for a determined period of time relates, in conformity with the Law on Nature Conservation and the Rules on the proclamation and protection of strictly protected and protected wild plant, animal and fungi species, the amount of collected quantity was stated as 0.*

Table 21. The most endangered species of medicinal herbs in Serbia and endangerment factors

Latin name	Serbian name	English name	Endangerment factors
Gentiana lutea* subsp. *symphiandra	линцура	Yellow gentian	**Uncontrolled collection, change of conditions and loss of habitat**
Gentiana punctata	арнаутски равен (линцура пегава)	Dotted-Flowered Gentian	**Change of conditions and loss of habitat, rare species**
Salvia officinalis	жалфија	Sage	**Uncontrolled collection**
Leontopodium alpinum	рунолист	Edelweiss	**Rare species, uncontrolled collection**
Drosera rotundifolia	росуља	Sundew	**Change of conditions and loss of habitat, rare species**
Arctostaphylos uva-ursi	медвеђе грожђе	Bearberry	**Uncontrolled collection**
Acorus calamus	иђирот	Calamus	**Uncontrolled collection, change of conditions and loss of habitat**
Helychrysum arenarium	смиље	Immortelle	**Uncontrolled collection, change of conditions and loss of habitat**
Glycyrrhiza glabra	сладић	Licorice	**Uncontrolled collection, change of conditions and loss of habitat**
Gypsophila paniculata	шлајер	Baby's-breath	**Uncontrolled collection, change of conditions and loss of habitat**
Angelica archangelica	анђелски корен	Garden Angelica	**Uncontrolled collection, change of conditions and loss of habitat**
Ruta graveolens	рута	The Common Rue	**Uncontrolled collection, change of conditions and loss of habitat**
Prunus laurocerasus	ловор-вишња	Cherry Laurel	**Uncontrolled collection, change of conditions and loss of habitat**
Castanea sativa	питоми кестен	Sweet chestnut	**Uncontrolled collection, change of conditions and loss of habitat**
Daphne alpina	личица	Alpine Daphne	**Uncontrolled collection, change of conditions and loss of habitat**
Daphne blagayana	Јеремичак	Blagay's Daphne	**Uncontrolled collection, change of conditions and loss of habitat**
Hyssopus officinalis	изоп	Herb Hyssop	**Uncontrolled collection, change of conditions and loss of habitat**
Juglans regia	орах	Walnut	**Uncontrolled collection, change of conditions and loss of habitat**
Adonis vernalis	гороцвет	Sweet Vernal	**Uncontrolled collection, change of conditions and loss of habitat**

Veratrum nigrum	чемерика црна	False Helleborine	**Rare species**
Menyanthes trifoliata	горка детелина	Buckbean	**Change of conditions and loss of habitat, rare species**
Pinus mugo	бор кривуљ	Mugo Pine	**Change of conditions and loss of habitat, rare species**
Vaccinium vitis idaea	брусница	Lingonberry	**Uncontrolled collection, change of conditions and loss of habitat**
Lycopodium clavatum	пречица	Clubmoss	**Change of conditions and loss of habitat, rare species, uncontrolled collection**
Fam. Orchidaceae	**орхидеје**	**Orchids**	**Uncontrolled collection, change of conditions and loss of habitat**

Source: FAO, the Second national report on the state of plant genetic resources for food and agriculture in Serbia, 2009; SEEDNET report for 2012 (South East European Development Network on Plant Genetic Resources)

According to the data of the Serbian Chamber of Commerce, trade with medicinal and aromatic herbs in Serbia in 2012 amounted to more than 24.5 million dollars, of which 19 million dollars was the income from export. However, the export of plants was dominated by spice herbs with about 2/3 of export, whereas the income from export of medicinal plants in narrower sense amounted to 5.8 million dollars. The largest importers of plants from Serbia were European Union countries (62%) and CEFTA countries (35%).

1.7.9. Game species

According to the data of the Forest Administration of the Ministry of Agriculture and Environmental Protection, which keeps records on the number of hunting areas, game, hunting maps, and other, there are 355 hunting areas in Serbia, of which 204 are located in Central Serbia, and 151 in Vojvodina. The total surface of all hunting areas is 7 680 747 ha, of which 2 154 966 ha (28.06%) is in AP Vojvodina, and 5 525 782 ha (71.94%) in the central part of the state.

By comparing the number of specimens of specific game species (the roe deer, wild boar, red deer and european hare), it is established that the European deer is the most represented species in Vojvodina, and the roe deer and wild boar in Central Serbia (54.71%). The rabbit is present in an approximately equal number, whereas the chamois, with 644 specimens, is present only in Central Serbia (Table 22, Figure 16). Regarding the grey partridge, there is only information about its total population in Serbia.

Pursuant to the Law on Game and Hunting ("The Official Gazette of the Republic of Serbia", No. 18/2010), each hunting year, which covers the period from April 1 of the current year to March 31 of the next year, hunting tickets are issued via which the hunters acquire individual right to hunt on the territory of the Republic of Serbia. According to the records of the Forest Administration, in the last 2013/2014 hunting year 66 460 hunting tickets were issued, which is about 6 000 tickets less compared to the previous 2012/2013 year, when there were 72 480 hunters with hunting tickets.

Table 22. Numbers of individual game species in Serbia and their percentual presence in relation to Central Serbia and AP Vojvodina. Source: Forest Administration of the Ministry of Agriculture and Environmental Protection

Game species	Total number of specimens	Central Serbia	%	AP Vojvodina	%
Roe deer	132 404	72 433	54.71	59 971	45.29
Wild boar	21 437	14 354	66.96	7 083	33.04
Red deer	5 648	2 050	36.30	3 598	63.70
European hare	568 960	283 760	49.87	285 200	50.13
Chamois	644	644	100.00		
Grey partridge	174 819				

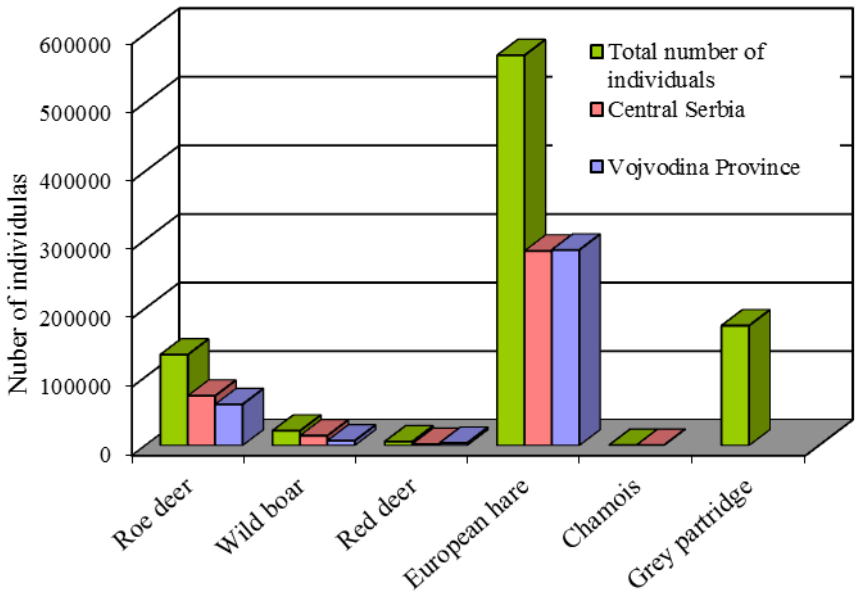


Figure 16. Overview of the numbers of individual game species in Serbia

2. IMPLEMENTATION OF THE NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN AND INTEGRATION OF BIODIVERSITY INTO OTHER SECTORS

2.1. The Biodiversity Strategy of the Republic of Serbia and the Action Plan for the period 2011-2018

The Biodiversity Strategy of the Republic of Serbia (NSBAP) for the period from 2011 to 2018 was enacted in February 2011 by the Government of the Republic of Serbia ("Official Gazette of the Republic of Serbia" No. 13/2011), as one of the main instruments for the implementation of the UN Convention on Biological Diversity at the national level. An elaboration of the Strategy was started in 2008 by the then Ministry of Environment and Spatial Planning and the UNDP as the agency for the implementation of the project for the elaboration of the Strategy. The funds were provided by the Global Environment Facility(GEF). The legal basis for the enactment of the Biodiversity Strategy of the Republic of Serbia for the period from 2011 to 2018 is Article 45 paragraph 1 of the Government Act in relation to the Law on the Verification of the Convention on Biological Diversity.

The Biodiversity Strategy has also been enacted in harmonization with the National strategy for the sustainable development of the Republic of Serbia ("Official Gazette of the Republic of Serbia", No. 57/2008). The fifth section of the Strategy has been dedicated to the issues of protection of the environment and preservation of national resources in the Republic of Serbia, as well as to the influences of the economic development on the environment and, among other things, goals, measures and priorities related to the protection of natural resources – water, air, land, forests, mineral resources, renewable sources of energy and biodiversity, have been stated. According to the Strategy for sustainable development of the Republic of Serbia, the defined level of projected funds allocated for the protection of the environment, including the protection of nature and biodiversity was 1.5% of the gross domestic product (GDP) until 2014, whereas the main goal is for the funds for protection of the environment to reach 2.5% of GDP until 2017.

The Biodiversity Strategy of the Republic of Serbia establishes basic principles for biodiversity protection in Serbia, which are harmonized with the principles of European Union within the process of harmonization of Serbian legislation with the EU legislation.

Basic principles of biodiversity protection in Serbia are:

- Principle of in-situ preservation
- Integrity principle
- Prevention and precaution principle
- Principle of conservation of natural values
- Principle of international cooperation
- Principle of system of protected areas
- Sustainable development principle
- Principle of responsibility of the polluter and his legal successor
- "Polluter pays" principle
- "User pays" principle
- Subsidiary responsibility principle
- Principle of implementation of incitement measures
- Principle of public information and public involvement

The Action plan for the implementation of the Biodiversity Strategy of the Republic of Serbia for the period from 2011 to 2018 contains activities, responsible institutions, and dynamics of execution and potential sources of finances for the implementation of the Strategy.

2.2. Strategic areas and objectives for biodiversity conservation in Serbia

The Biodiversity Strategy of the Republic of Serbia, in addition to the basic principles for the protection of biodiversity, also contains an overview of biological diversity (diversity of species, ecosystems, genetic diversity) and the system for the protection of biodiversity (protected species, protected areas and ecological networks), institutional, legislative and financial frameworks for the conservation of biodiversity and especially the factors and causes of threats (pressures, direct and indirect factors).

The Biodiversity Strategy and the Action plan define 11 strategic areas and 28 objectives for protection of biodiversity in Serbia (Table 23), with more than 140 different activities which should secure their realization.

Table 23. Strategic areas and objectives for protection of biodiversity in Serbia

Strategic area	Subarea	Objective
1. Conservation of biodiversity	Endangered biological diversity	1.1 Enable the sustainability of endangered species and ecological communities in their natural habitats because of genetic diversity and potentials for evolutionary development. Regain biological diversity in degraded areas. Implement *in-situ* measures for the conservation through maintenance of *ex-situ* locations and implementation of ex-*situ* conservation measures.
	Management of threatening factors	1.2 Monitor, regulate and decrease the influence of processes and activities which have or will probably have significant adverse effects on biodiversity
2. Protected areas system	Effectiveness of protected areas system	2.1 Establish and manage an all-encompassing, adequate and representative protected areas system which enables biological diversity of the Republic of Serbia.
	Financing of a protected areas system	2.2 Secure availability of financial assets for the maintenance and expansion of the protected areas system in the Republic of Serbia, together with strengthening long-term financial sustainability of the system

3. Sustainable utilization of biodiversity, approach and allocation of profit and economic evaluation	Sustainable utilization of biodiversity	3.1 Develop new and strengthen the existing mechanisms in order to secure sustainable utilization of biological diversity in the Republic of Serbia. Promote these mechanisms within public and private sector.
	The approach and the allocation of profit	3.2 Secure that social and economic benefit from the utilization of genetic resources and other products and services of biological diversity remain within the Republic of Serbia.
	Economic evaluation of biodiversity	3.3 Increase national awareness and utilization of methods for the economic evaluation of biodiversity in order to get a more precise evaluation and calculation of economic benefit of the protection of biodiversity in relation to the activities which lead to the loss of biodiversity
4. Political, legislative, institutional and financial frameworks for biodiversity conservation	Political framework	4.1 Strengthening and enlargement of the political framework for the conservation of biodiversity
	Legislative framework	4.2 Strengthen the legislative framework for the conservation of biodiversity and secure the implementation and harmonization of legislation which relates to biodiversity
	Institutional framework	4.3 Strengthen the institutional framework for the biodiversity conservation
	Financial framework	4.4 Strengthen and enlarge the financing of the conservation of biodiversity and provide incitement for the conservation of biodiversity within all sectors
5. Integration of biodiversity conservation into other sectors	Integrated policies and guidelines	5.1 Create and implement integrated policies for the conservation and sustainable utilization of biodiversity at the national level
	Integration of biodiversity into other sectors	5.2 Integration of biodiversity into all relevant sectors

6. Knowledge database	National information system for biodiversity (NISB)	6.1 Gather, examine and unite available data and information on biodiversity in order to provide a basis for evaluation of the state, monitoring, conservation and sustainable utilization of biodiversity
	Biodiversity monitoring	6.2 Establish a national program which will identify and monitor priority species, habitats and genetic components of biodiversity, as well as causes and consequences of the activities which endanger components of biodiversity
	Biodiversity research	6.3 Provide support to understanding and conservation of biological diversity in the Republic of Serbia
7. Capacity building	Building technical capacities	7.1 Build and strengthen the capacities within all competent public and private institutions for the conservation of biodiversity and sustainable utilization
	Infrastructure and equipment	7.2 Develop necessary infrastructure and provide the basic equipment for monitoring, conservation and sustainable utilization of biodiversity within the competent institutions
8. Education, information and involvement of the public	Formal education	8.1 Improve public understanding of the importance of biodiversity and develop capacities for the study and protection of biodiversity through inclusion of information on biodiversity into teaching plans and programs
	Public information	8.2 Incite the understanding of the public, support and activities on the conservation of biodiversity through information
	Involvement of the public	8.3 Include local population and communities into planning, decision-making and conservation of biodiversity
9. International cooperation	Coordination with other international instruments for the conservation of biodiversity	9.1 Secure coherency and coordination between this strategy and other international obligations related to biodiversity

	Regional and international cooperation	9.2 Secure constant and efficient international cooperation for the protection of biodiversity
10. Climate change	State activities regarding climate change	10.1 Develop national strategies and mechanisms in order for the potential influence of climate change on biodiversity to be understood, planned and reduced to the smallest possible level
	Research, monitoring and evaluation of climate change	10.2 Increase the capacities of competent institutions for the monitoring and prediction of the influence of climate change on biodiversity and the evaluation of effectiveness of the strategy and adaptation measures
	Awareness of climate change	10.3 Enhance awareness of climate change in all sectors and in the public regarding the influence of climate change and the adaptation strategies
11. Implementation of the Strategy	Financing of the Strategy	11.1 Secure various sources and strategies for long-term financing of the Strategy. Make sure that the costs of the conservation of biodiversity be allocated between institutions and interested parties so as to reflect the contribution to the degradation of biodiversity and the benefits from its protection and utilization
	Coordination, consideration and update of the Strategy	11.2 Determine appropriate mechanisms and create necessary capacities for the realization, monitoring and improvement of the Strategy

2.3. Revision of the Biodiversity Strategy of the Republic of Serbia

The implementation of the project " National Biodiversity Planning to Support the implementation of the CBD 2011-2020 Strategic Plan in the Republic of Serbia", which is implemented jointly by the Ministry of Agriculture and Environmental Protection and the UNDP, started in 2013, within the BDEA (Biodiversity Enabling Activities) financed by the Global Environment Fund. The goal of this project is to provide support to Serbia in fulfilment of obligations which were taken by signing the Convention on Biological Diversity, with a focus on Article 6 of the Convention, which relates to development of new or

adaptation of the existing national strategies, plans or programmes for the conservation and sustainable utilization of biodiversity and its integration into relevant sectoral or cross-sectoral plans, programmes and policies. Besides the above-mentioned, it includes decision number 2 from the conference of signatories of the Convention on Biological Diversity, which was held in 2010 in Japan (CBD, COP Decision X/2), which partly relates to the provision of support to the improvement of national strategies in the process of harmonization with the Strategic Plan for Biodiversity for the 2011-2020 period.

At the beginning of 2014, within the above-mentioned project, with the aim of obtaining more complete information on the progress in the implementation of the current Biodiversity Strategy and on the planning of further activities on the conservation of biodiversity in Serbia, a Questionnaire on the evaluation of the progress in the implementation of the Strategy was prepared and distributed to relevant institutions in Serbia which deal with the protection of nature and biodiversity. The questionnaire refers to the assessment of the status of realization of each individual activity defined in the Action plan of the Strategy, i.e. since 2011, to the results and most important achievements of individual institutions, allocated financial assets for the implemented measures and their sources. The Questionnaire also contains information about plans and priorities of institutions during the following period.

The answers to the questions in the Questionnaire were delivered by 26 governmental, scientific and expert institutions, managers of protected areas and non-governmental organizations.

The analysis of the obtained data is shown in chapter 2.7, which relates to the Evaluation of progress in the implementation of NSBAP – planned and realized activities with examples of good practice.

2.4. Activities taken at the national level regarding implementation of the Convention on Biological Diversity, after submission of the Fourth national report (2011-2014)

2.4.1. Institutional framework of the environmental sector during the period from 2011 to 2014

Until 2012, the Ministry of Environmental Protection and Spatial Planning was competent for the environmental, natural and biodiversity protection operations. At the beginning of 2012, after parliamentary elections in Serbia, changes in the institutional structure in the environmental sector occurred, so the environmental protection now belonged to the competence of the Ministry of Energy, Development and Environmental Protection, whereas the Ministry of Natural Resources, Mining and Spatial Planning was competent for the system of the protection and sustainable development of natural resources (Law on Ministries "Official Gazette of the Republic of Serbia", No. 72/2012). In 2013, the Ministry of Energy, Development and Environmental Protection started a revision of NSBAP. During the same period, based on the Law on termination of the Law on the Environmental Protection Fund ("Official Gazette of the Republic of Serbia", No. 93/2012), the Environmental Protection Fund, whose competence was to perform operations related to the financing of the preparation, implementation and development of programmes, projects and other activities in the field of conservation, sustainable utilization, protection and improvement of the environment (among other things, the protection and conservation of biodiversity, Article 17 paragraph 1 point 5 of the Law on the Environmental Protection Fund, "Official Gazette of

RS", No. 72/2009 and 101/2011), as well the area of utilization of renewable sources of energy, was cancelled.

In conformity with the Law on Ministries ("Official Gazette of RS", No. 44/2014), the competences in the area of environmental protection and, within it, the protection of nature, belong to the Ministry of Agriculture and Environmental Protection.

2.4.2. Improvement of the strategic and legal framework which relates to environmental protection and the protection of nature, during the period from 2011 to 2014

- The National strategy for sustainable utilization of natural resources and goods was enacted ("Official Gazette of the Republic of Serbia", No. 33/2012), and it was created with the support provided by the Swedish International Development Cooperation Agency (SIDA) and the Swedish Environmental Protection Agency;

- The National Environmental Approximation Strategy for the Republic of Serbia ("Official Gazette of the Republic of Serbia", No. 80/2011) (NEAS) was enacted with the aim of providing the basis for the accession negotiations in relation to Chapter 27. The NEAS was created within the project financed by the European Union "Technical Aid in the Creation of the National Environmental Approximation Strategy for the Republic of Serbia", based on the National Environmental Protection Programme for the integration of the Republic of Serbia into EU, the National Environmental Protection Programme and the National Strategy for Sustainable Development.

- Within 66th session of the United Nations General Assembly (New York, 2011), Serbia ratified the Nagoya Protocol which improves access to and allocation of the profit from genetic resources and provides larger legal safety of providers and users of these resources. By promoting the utilization of geographical resources, traditional knowledge and possibilities or fair allocation of the profit gained from their utilization, the Protocol creates initiatives for the conservation of biodiversity and its sustainable utilization. Serbia is a participant in the work of International Committee for the Implementation of the Nagoya Protocol and it takes legal, administrative and/or political measures in order to secure that the benefits from genetics resources are equally shared with the allochthonous communities from which they have originated;

- The Law on verification of the European Landscape Convention has been enacted ("Official Gazette of RS – International contracts", No. 4/2011);

- The following sublegal acts have been enacted or revised: the Decree on the Control of the Utilization and Trade in Wild Flora and Fauna ("Official Gazette of the Republic of Serbia", No. 31/2005, 45/2005, 22/2007, 38/2008, 9/2009 and 69/2011), the Decree on Protection Regimes ("Official Gazette of the Republic of Serbia", No. 31/2012), the Rulebook on the National List of Environmental Protection Indicators ("Official Gazette of the Republic of Serbia", No. 37/2011), the Rulebook on the Proclamation and Protection of Strictly Protected and Protected Wild Species of Plants, Animals and Fungi ("The Official Gazette of the Republic of Serbia", No. 5/2010 and 27/2011), the Rulebook on the Proclamation of Game Species Protected by Closed Season ("The Official Gazette of the Republic of Serbia", No. 9/2012), The Rulebook on the conditions to be fulfilled by shelters accepting protected wild

animals, ("The Official Gazette of the Republic of Serbia", No. 15/2012), The Rulebook on cross-border turnover and trade in protected species ("The Official Gazette of the Republic of Serbia", No. 99/2009 and 6/2014), The Rulebook on the criteria for the evaluation and process of categorization of individual protected wild flora and fauna species in 2011 ("The Official Gazette of the Republic of Serbia", No. 24/2011), in 2012 ("The Official Gazette of the Republic of Serbia", No. 24/2012), in 2013 ("The Official Gazette of the Republic of Serbia", No. 21/2013), and in 2014 ("The Official Gazette of the Republic of Serbia", No. 23/2014);

- The draft of the Law on changes and amendments of the Law on Environmental Protection has been prepared (it is in the process of obtaining opinion from the competent state authorities);

- The elaboration of the National plan for the realization of the National programme for environmental protection is in process;

- The work on changes and amendments of the Decree on the Ecological Network is in the procedure;

- The Decree on appropriate assessment is being drafted;

- The Law on National Parks is being drafted;

- The Law on Ratification of the Forest Protocol within the Carpathian Convention is being drafted;

- Preparation of a draft of the Law on the Management of Plant Genetic Resources for Food and Agriculture (which should include the segments of plant genetic diversity, establishment of National Council for Plant Genetic Resources and other) has been started;

- Within the coordination and preparation of materials for Chapter 27 (the environment), in 2013, the National plan for the adoption of the EU acquis communautaire (NPAA) was created and it is comprised of the following areas: horizontal legislation, air quality, climate change, noise, waste, waters, protection of nature, chemicals, forestry, industrial pollution and civil protection. The document provides an overview of the current state and a detailed plan for the realization of legislative priorities and implementation priorities for 2013 for each named subchapter. For the 2014 – 2016 period, framework plans for the realization of legislative and implementation priorities (transposition/implementation of EU regulations) have been provided. The above-mentioned document contains, as its constituent part, a list of legal and sublegal acts which transmit EU regulations and whose adoption represents a priority, and which will, together with deadlines for their enactment, represent a basis for the monitoring of the realization of the National plan for the adoption of EU acquis communautaire in the area of the environment.

<u>Projects in the area of the environment and the measures which are being implemented for its protection</u>

- The beginning of the implementation of the project "Planning of conservation of biodiversity at the national level as a support to the implementation of the Strategic plan of the Convention on Biological Diversity for the 2011-2020 period in the Republic of Serbia";
- The project "The First biannual report according to the UN Framework Convention on Climate Change" has been initiated, as a new obligation according to the Convention, as well as the project "The second national communication of the Republic of Serbia according to the UN Framework Convention on Climate Change". The financial funds for the realization of this project will be provided from the Global Environment Facility (GEF), whereas the implementation agency will be the United Nations Development Programme (UNDP);
- The project idea for the Strategy to combat climate change and the action plan have been elaborated, and they will be financed from unallocated IPA 2012 funds;
- The draft of the agreement between the Government of the Republic of Serbia and the Government of the Republic of Croatia on cooperation in the area of environmental protection and nature conservation has been created;
- Within the project "Strengthening capacities for the preparation of Nationally Appropriate Mitigation Actions (NAMAs)", realized in cooperation with the Japanese International Cooperation Agency (JICA), project documentation is currently being created for 7 out of 16 infrastructural projects, which have been singled out as priority projects at the national level in the area of decrease of emissions of greenhouse gases;
- The implementation of the INSPIRE Directive (Infrastructure for Spatial Information in Europe) in Serbia in the area of environmental protection, whose basic goal is the establishment of the legal framework for the establishment and operation of infrastructure for spatial information in the European community, is performed within the projects "The Danube Reference Data and Service Infrastructure – DRDS" and "The National Spatial Data Infrastructure and Centre for Remote Detection for the Republic of Serbia". The goal of the first project is the provision of support to the Danube strategy through provision of support to the implementation of INSPIRE directive in the region. The second project is realized by the Serbian Geodetic Institute in cooperation with the French consortium "IGN France International" and "EADS Astrium", through which Infoterra Geo-Information Solution program (IGIS) is implemented. The goal of this project is the formation of a unique geospatial data system, including the mapping of land cover, agro-ecological and natural habitats in 6 pilot areas (which represent 20% of the total territory of the Republic of Serbia).

2.5. Integration of biodiversity objectives into other sectors

One of the goals of the Biodiversity Strategy is related to the integration of the conservation of biodiversity into other sectors, through integration of the principles of conservation of biodiversity and sustainable utilization into policies, plans, programmes and production systems which are oriented towards production, economic activity and development. The Strategy recognizes the need for the integration of biodiversity into production sectors in Serbia, especially those which have a direct benefit on natural resources and manage these resources – agriculture, forestry, fishing, utilization of plants and animals, mining, production of electric power and tourism.

The existing mechanisms for the conservation of biodiversity and the integration of biodiversity goals into other sectors are implemented through the Law on Nature

Conservation and Conditions of Nature Conservation, the Law on the Strategic Evaluation of the Influence on the Environment ("The Official Gazette of the Republic of Serbia", No. 135/2004 and 88/2010), the Law on the Evaluation of the Influence on the Environment ("The Official Gazette of the Republic of Serbia", No. 135/2004 and 36/2009), and this has also been stipulated through appropriate assessmentas a future instrument. For sectoral activities, in the procedure for the enacting of the conditions for the conservation of nature, an evaluation is made whether the planned works and activities can be realized from the aspect of nature conservation and the enacted regulations and documents. The decision on the conditions for nature conservation is issued by the competent institute for nature conservation (state or provincial).

Pursuant to the Law on Nature Conservation, the project holder who can be a legal entity, an entrepreneur or a natural person, and who utilizes natural resources, performs construction and other works, activities and interventions in nature, is obliged to act in conformity with the measures for nature conservation, which are defined in plans, basis and programmes, and in conformity with the project-technical documentation, in such a manner to avoid endangerment of and damage to the nature, or reduce them to the minimum. After the works have been completed, the project holder is obliged to perform restoration, i.e. re-cultivation.

The Law on Nature Conservation introduces a new instrument for nature conservation in Serbia – appropriate assessment. As EU acquis communautaire, it represents a basic protection mechanism of the European ecological network Natura 2000. In Serbian legislation, appropriate assessment is closely connected to the ecological network and its primary purpose is conservation of the basic values of ecologically significant areas that have been defined by the Decree on the ecological network. After the accession to the European Union, the European Commission will also have certain competences regarding the control of the implementation of the procedure of the appropriate assessment. The proceeding of the elaboration and adoption of the Decree on appropriate assessment is currently ongoing in Serbia, and it will define the implementation of this instrument within nature conservation more closely.

National Environmental Approximation Strategy for the Republic of Serbia

In order to provide a basis for EU accession negotiations and harmonization of regulations, institutional organizations and work practices (EU acquis communautaire), the National Environmental Approximation Strategy for the Republic of Serbia (NEAS) has been elaborated within the project "Technical Aid for the Elaboration of the National Environmental Approximation Strategy for the Republic of Serbia", which was financed by the European Union.

Chapter 5.2.3 of the National Environmental Approximation Strategy for the Republic of Serbia, which relates to the Strategy for the Economic and Financial Approximation and Influence on the Republic of Serbia, states that the assignment of funds from GDP for the environment in the Republic of Serbia amounts up to 0.9% of GDP, which is 0.5% higher than the estimates provided in the National programme for environmental protection and in the report "Needs of the Republic of Serbia for international aid in the period from 2011 to 2013" (0.4% of GDP). Based on the available data, it can be presumed that the stated difference originated because the contribution made at the local level has not been taken into consideration in the National programme, as well as the contribution made by the industrial and private sector, whereas the NEAS has included all of these contributions. The projected

GDP for the environmental department should reach 2.5% until 2021, with the existing 0.4% included, and if a GDP percentage of 0.9% is included, which is the currently allocated percentage, it could even reach 3%.

The NEAS represents a frame for Chapter 27 which relates to the environment. Regarding the nature conservation sector, it has been concluded that the Law on Nature Conservation should be rationalized, which relates to the inclusion of Natura 2000 areas into the complete legal framework for the protected areas. The NEAS especially emphasizes the implementation of the Directive on Birds (79/409/ EEC), the Directive on Habitats (92/42/ EEC) and the Directive on Birds and Habitats (92/43/EEC).

According to the NEAS, the implementation of EU regulations on endangered species will be realized through the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (the Law on Verification of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, "Official Gazette of the Federal Republic of Yugoslavia – international contracts", No. 11/2001, based on the Council Regulation (EC) No 338/97 on the protection of species of wild fauna and flora by regulating trade therein), together with the issue of transposition/implementation of the Decree on animal welfare (95/88/EC).

Fishing

The management of fish stocks in fishing waters, which includes the protection and utilization of fish stocks as natural riches and goods of general interest, with the aim to provide equal structure and rate of its utilization in the long term, has been regulated in the Law on protection and sustainable utilization of fish stocks ("Official Gazette of RS", No. 36/2009) and a set of its sublegal acts. The Law defines measures for the protection, conservation and sustainable utilization of fish stocks, the measures for the protection of fish hatcheries, fish and the young in the flood areas, limitations in the utilization of fishing waters, conservation of the ecosystems of fishing waters and other.

The most significant act which is directly related to the protection and conservation of fish stocks is the Order on the measures for the conservation and protection of fish stocks ("Official Gazette of the Republic of Serbia", No. 104/09, 49/10), which defines the species for which fishing is permanently forbidden, species for which fishing is prohibited during a defined time period within the year as well as fishing below a defined quantity, daily allowed quantities of autochthonous fish species in recreational fishing and species for which unlimited fishing is allowed within recreational and commercial fishing.

The monitoring of the states and trends in fish population and collection of other data significant for the protection and sustainable utilization of fish stocks have been defined by the Rulebook on the monitoring programme for monitoring the state of fish stocks in fishing waters ("Official Gazette of the Republic of Serbia", No. 104/09, 49/10).

Forestry

Conditions for the sustainable management of forests and forest land as goods of general interest, in a manner and scope which permanently maintains and improves their production capacities, biological diversity, capacity for renewal and vitality and improves their potential for mitigation of climate change, as well as their economic, ecological and social functions,

without harming the surrounding ecosystems, have been defined by the Law on Forests ("Official Gazette of the Republic of Serbia", No. 30/2010). This Law defines constant monitoring and analysis of the state of forest ecosystems, and especially their vitality, health status and biodiversity in order to take measures for prevention and their protection.

Bearing in mind that forests provide multiple benefits, that they provide raw materials for renewable and ecologically healthy products and that they play an important role in the economic welfare, biodiversity, global circulation of carbon and water balance, that they are important for the development of ecological, protective, touristic-recreational, health and cultural services and that they represent a pillar of sustainable development for each society, the Forestry Development Strategy has been enacted, which defines general developmental goals of the forestry sector in Serbia, as well as appropriate measures for the achievement of these goals ("Official Gazette of the Republic of Serbia", No. 59/2006).

Hunting

The aim of the Law on Hunting ("Official Gazette of the Republic of Serbia", No. 18/2010) is "the provision of sustainable management of game animals population and their habitats in a manner and within a scope which permanently maintains and improves the vitality of game animals population, the production capacity of habitats and biological diversity, through which fulfillment of economic, ecological and social functions of hunting is achieved". In that sense, biological diversity is one of the contexts in which hunting management is realized. This Law also defines "monitoring of game animals population and habitats", as one of the measures for the realization of general interests of breeding, conservation and utilization of game animals population. The significance of monitoring for the conservation of game animals population and their habitats has also been recognized, which is also important for the conservation of the total biodiversity.

In conformity with the Law, game animals can be introduced into a hunting ground only if that does not harms the biological balance and biological diversity. Introducing of allochthonous game animals into a hunting ground, introducing of imported game animals into a hunting ground, as well as transfer of game animals from one hunting ground to another, are allowed to be performed in conformity with the programme for the settlement of game animals, with a license issued by the ministry which is competent for the environmental protection operations. This prevents uncontrolled introduction of allochthonous species into free nature, which would additionally threaten biodiversity.
The Rulebook on the proclamation of game animal species protected by closed season ("Official Gazette of RS", No. 9/12), as a sublegal act, regulate more closely the rules on the manner and measures of breeding, protection and use of game animals, as well as the duration of the hunting season.

Agriculture and rural development

The Law on Organic Agriculture ("Official Gazette of the Republic of Serbia", No. 30/2010) incites a rational use of energy and natural resources, such as land, water, organic matters and similar. The principles which have been stated in the Law, such as the management of natural and biological processes and maintenance and improvement of the living conditions in soil and the natural advantages of soil, the stability of soil, are based on ecological systems and a sustainable utilization of natural resources.

Within the Law on Agriculture and Rural Development ("Official Gazette of the Republic of Serbia", No. 41/2009 and 10/2013), the conservation of biodiversity has been defined through structural incitements and measures for rural development, which incites programmes for the protection of the environment and the conservation of biodiversity.

Pursuant to the Law on the Means for the Protection of Plants ("Official Gazette of the Republic of Serbia", No. 41/2009), conservation of natural resources is defined through good agricultural practice, which implies performance of agricultural activity in a manner which enables the management of agricultural land and reproductive material, with reverence of natural characteristics of an agricultural area and an optimum combination of agrotechnical measures with the aim of conserving natural fertility of agricultural land and preventing excessive pollution of the environment.

A draft of the National Agri-environment Programme has been made and it defines some of the areas of high natural values in Serbia and points out the advantages of agricultural practice which benefits the conservation of biodiversity.

Also, a Draft of the National Programme for the Conservation of Plant Genetic Resources for Food and Agriculture in Serbia has been elaborated, with the help provided by FAO technical support project, and it describes the current state, states goals and proposes measures related to the conservation, utilization and development of plant genetic resources for food and agriculture. The Draft is harmonized with the national regulations in the area of agriculture, and with international conventions and contracts, such as the Convention on Biological Diversity, the Law on Verification of International Contract on Plant Genetic Resources for Food and Agriculture ("Official Gazette of the Republic of Serbia – International Contracts", No. 1/2012) and Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture. The measures for the conservation of plant genetic resources for food and agriculture have also been entered into the Draft of the National strategy for agriculture and rural development, as well as in the Draft of the National programme for agriculture and rural development within agri-environment measures.

The national collection of plant genetic resources for food and agriculture contains 5000 samples of 273 species and it is being kept as a service at the "Zemun Polje" Institute for corn until it is transferred to the Plant gene bank. The equipment for the Plant gene bank has been obtained through two international projects which were financially assisted by the Swedish International Development Cooperation Agency SIDA and FAO. At the Gene bank, samples of cultivated plant seeds will be kept in the long run at 18°C under *ex situ* conditions.

The Law on the Management of Plant Genetic Resources for Food and Agriculture is currently being elaborated and it will regulate all of the most important matters in this area, among others: collection activities, evaluation, characterization, replication and regeneration, documentation, licenses for collection, exchange, approach and allocation of benefits, as well as the establishment of the National Council, status of the Plant Gene Bank, and other.

The Ministry of Agriculture and Environmental Protection supports the conservation of plant and animal genetic resources for food and agriculture, which has been defined by the Rulebook on Incitements for the Conservation of Plant Genetic Resources ("The Official Gazette of the Republic of Serbia", No. 85/2013) and the Rulebook on Incitements for the Conservation of Animal Genetic Resources ("The Official Gazette of the Republic of Serbia", No. 83/2013), enacted on the basisi of the Law on Incitements in Agriculture and Rural Development ("The Official Gazette of the Republic of Serbia", No. 10/2013).

Energetics

The ecological aims related to the emission of hazardous matters from production and consumption of energy are included in the Serbian energy policy. In addition, certain ecological demands are stated in the legislation which is being harmonised with the European standards, as well as within the obligations stipulated by wider international contracts.

On its way to getting the status of a candidate for the accession to the European Union, the Republic of Serbia has accepted a large number of obligations and regulations in the area of energy and protection of nature and the environment, and one of the priorities regarding energy at the national and European level is also the development of renewable sources of energy. The Republic of Serbia has, by enacting the Law on Verification of the Treaty establishing the Energy Community between the European community and the Republic of Albania, the Republic of Bulgaria, Bosnia and Herzegovina, the Republic of Croatia, the Former Yugoslav Republic of Macedonia, the Republic of Montenegro, Romania, the Republic of Serbia and the United Nations Interim Mission in Kosovo, pursuant to the Resolution 1244 of the United Nations Security Council ("The Official Gazette of the Republic of Serbia", No. 62/06), accepted the requirements for the enlargement of interior energy market of the EU into its region, as well as the fulfilment of conditions for the improvement of social, economic and ecological standard in the region. This contract represents a key document between Serbia and the EU in the area of energy, covers reforms of the energy sector which are necessary for the accession to the EU, preparation of the energy market for the full implementation of European requirements and the implementation of the EU's directives, and the participation in the unique energy market of Europe, but also acceptance of obligations related to the state of the environment, the increase in energy efficiency and the use of renewable sources of energy in the region (Safner *et al.,* 2013).

The improvement of the environment in all areas of energetic activities represents a long-term goal of the energetic policy of the Republic of Serbia. Pursuant to the Law on Energy ("The Official Gazette of the Republic of Serbia", No. 57/2011, 80/2011 - correction, 93/2012 and 124/2012), the Draft of the Energy Development Strategy of the Republic of Serbia for the period until 2025 has been enacted, together with projections until 2030, and it includes the segment of environmental protection. The environmental protection, in the sense that an evaluation of the influence of the construction of an energetic object on the environment has been determined and that the potential consequences of the detrimental influence of the construction of that object on the land, waters, air and other natural values have been observed, represents a condition for the issuance of an energetic license pursuant to the Rulebook on More Closely Defined Conditions for the Issuance of Energetic Licenses, the Content of the Request and the Manner of Issuing Energetic Licenses, as well as the conditions for providing consent to the energetic objects for which an Energetic License is not Issued ("The Official Gazette of the Republic of Serbia", No. 60/2013).

In general, the Law on Energy adopts the principles of environmental protection, but does not treat the protection of nature and biodiversity specifically. In comparison with the Draft of the Energy Development Strategy, the strategic approach to the development of energetics implies such utilization of energetic resources which enables a better protection of nature. Long-term goals for the development of production capacities which perform the function of the security of supply, appreciate technological, economic criteria and the criteria for environmental protection as well. The remaining technical hydro potential and the possibility of its utilization will also be determined in conformity with the non-energetic criteria which are related to multiple use of waters and the problems regarding environmental protection.

In the proposal of the Energy Development Strategy, one of the demands which will be dominant in the future is that the production and consumption of energy leave as few negative consequences as possible on the environment (water, air, land), and indirectly on biodiversity, the complete food chain and human health. The strategy is generally focused on the problems of a decrease in the influence on the environment, and above all, on the decrease in the pollution and emission of CO2. The protection of nature and biodiversity are only generally mentioned, although some developmental directions, such as hydroenergy and wind energy, can have significant influences on biodiversity.

Water management

The Republic of Serbia has started harmonization of the legislation in this area by including the provisions of European directives which relate to waters, the Water Framework Directive 2000/60/EC, the Floods Directive of the European Community, the Directives which relate to subterranean waters, the Directives which relate to the protection of quality of waters, and others, into the Law on Waters ("The Official Gazette of the Republic of Serbia", No. 30/10 and 93/12).

Article 110 of the Law on Waters is especially significant for the area of the protection of biodiversity, and it contains provisions of Annex V to the Water Framework Directive:
In order to protect waters and the aquatic ecosystems, special protection measures need to be implemented, so a register or registries of protected areas are established. The protected areas are:
° *Zones of sanitary protection of water sources, areas intended for taking water for human consumption in the future;*
° *Water bodies intended for recreation, including the areas intended for swimming;*
° *Areas which are sensitive to nutrients, including the areas subject to eutrophication and the areas sensitive to nitrates from agricultural sources* (Directives 91/676/EEC and 91/271/EC);
° *Areas which are intended for the protection of habitats or species, where maintenance or improvement of water status represents an important element of their protection* (from the program NATURA 2000 pursuant to Directives 92/43/EEC and 79/409/EEC);
° *Areas intended for protection of economically significant aquatic species.*

The enactment of Decree on Borderline Values of Pollutant Emissions into Waters and Deadlines for their Achievement ("The Official Gazette of the Republic of Serbia", No. 67/2011 and 48/2012), The Rulebook on the Identification of Water Bodies of Surface and Subterranean Waters ("The Official Gazette of the Republic of Serbia", No. 96/2010), and The Rulebook on the Parameters of the Ecological and Chemical Status of Surface Waters and the Parameters of the Chemical and Quantitative Status of Subterranean Waters ("The Official Gazette of the Republic of Serbia", No. 74/2011) created the conditions for the organization of water monitoring pursuant to provision of Article 109 paragraph 1 of the Law on Waters, as well as the demands of the Water Framework Directive (2000/60/EC), through the establishment of annual monitoring of the status of waters with supervisory and operative monitoring. The monitoring of the status of waters in protected areas also includes additional indicators, depending on the character of the protected area (Article 107). This represents a necessary segment in the procedure of harmonization between the system for water monitoring which has been utilized until now in Serbia and the provisions of the Law on Waters, as well as the demands of the EU Directives.

Water management plan, pursuant to the Law on Waters, represents a new type of planning document for water management, which has been harmonized with the demands of the Water Framework Directive. The plan, following the principles and strategic solutions from the Water Management Strategy, determines the policy of water management in a specific space. The Water Management Plan should contain all necessary elements which secure rational utilization and protection of waters in the considered area, as well as protection from waters, which also includes an evaluation of the necessary funds for the realization of the planned activities, the dynamics and manner of their procurement. It represents a significant fact for the area of biodiversity protection that Article 33 item 9 (which describes the content of the management plan) states that a part of the plan is "a summary of the register of protected areas, with a map in which the position of protected areas is marked and the appropriate regulations pursuant to which those areas have been proclaimed as protected areas". The aim is to obtain all the necessary data for the basins in order to provide protection of water regime through these measures, and, among other things, to provide harmonization with the demands for protected areas.

An example of good practice – the water sector

Within the IPA 2010 programme, the European Union has financed the project "Preparation of Documentation for Hydrotechnical and Dredging Works in Critical Sectors on the Danube River in the Republic of Serbia", which has been managed by the Waterways Directorate – Plovput".
The project was implemented in the period from 2011 to 2013 in order to prepare the documentation for hydro-technical works on the Danube River in Serbia, from the 1295th km to the 1179th km, which will establish the minimum depth and width of the waterway for safe sailing during the periods of low water level. The Study on the Evaluation of the Influence on the Environment has been also elaborated within the project.
The project included the establishment of the Forum of Interested Parties, pursuant to the orientation of the Waterways Directorate toward the implementation of a modern concept of integral management of inland waterways, as well as pursuant to the identified good practice which has been applied in the implementation of similar projects on the Danube River. The integral management of inland waterways includes the aspiration towards the harmonization of interests of different interested parties, while complying with the national and international legal framework.
The basic principles which have been adopted during the process of defining the potential solutions for the critical sectors include the conservation of the conditions for the connection of water flows, the implementation of non-rooted buildings, the conservation of sediment transportation balance, the provision of measures for the mitigation of influences and compensatory measures.
The activities of the Forum of Interested Parties which have been realized within this project represent an example of good cooperation within the projects for the performance of hydro-technical works on the security of the volume of waterways (the design and construction of water objects).

Mining

The Law on Mining and Geological Researches ("The Official Gazette of the Republic of Serbia", No. 88/2011), recognizes the significance of the conditions for environmental protection during research and exploitation, the control of the harmonization of a project with

the conditions, as well as the re-cultivation of the area in order to provide spontaneous development of autochthonous species.

Tourism

The regulation of tourism is based on the principle of sustainable tourism, which also implies the conservation of natural values. In order to direct and incite the development of tourism, the Law on Tourism ("The Official Gazette of the Republic of Serbia", No. 36/2009, 88/2010, 99/2011 and 93/2012) stipulates the provision of funds for the participation in the financing of projects which deal with the protection of nature, environment and natural resources of a tourist location. In addition to that, this law also provides the possibility of a proclamation of a tourist area which can also contain protected natural goods and recognizes natural values as potential components of tourist products. In the part of a tourist area which simultaneously represents a protected area, a protection regime and internal order will be applied pursuant to the regulations which regulate the conservation and use of natural values.

The Law stipulates the elaboration of the Tourism Development Strategy, which defines long-term goals of tourism in conformity with the total economic, social, ecological and cultural-historical development. It has also been envisaged that the Strategy will contain analysis of the influence of tourism development on natural goods.

The Tourism Development Strategy ("The Official Gazette of the Republic of Serbi", No. 91/2006) recognizes preserved natural values as the comparative advantage of tourism in Serbia, following the trend of the increase in the number of tourists who are interested in natural values. Bearing in mind that the potentials of nature represent one of the advantages on which competitiveness of tourism in Serbia is grounded, the provision of long-term protection and integrated management of natural and cultural resources are included in the goals of the development of tourism. According to the touristic vision which has been stated in the Strategy, Serbia should present itself as a country which is dedicated to the maximum to conservation and protection of all of its natural and cultural treasures, which is why it is necessary to increase the surface of protected areas to 15-20% of the territory of the Republic of Serbia in order to improve the touristic product of Serbia. However, due to insufficient cooperation between sectors, it has been assessed that the necessary protection of natural resources has not been achieved yet.

Intersectoral activity – spatial planning

Spatial planning and landscaping in the Republic of Serbia has been regulated by the Law on Planning and Construction ("The Official Gazette of the Republic of Serbia", No. 72/2009-correction, 64/2010-decision of the Constitutional Court, 24/2011, 121/2012, 42/2013-decision of the Constitutional Court and 50/2013-decision of the Constitutional Court). The Law is based on the principles of sustainable management and protection and revitalization of the environment and natural values, and it is implemented through spatial and urban plans and the technical documentation for the construction of objects and landscaping.

Regional spatial plans, spatial plans for special purpose areas, spatial plans of local self-government units and urban plans contain the conditions for the protection of nature which are defined by the institutes for nature protection. In order to fully implement the above-mentioned planning documents, the measures for the protection of biodiversity are defined as developmental rules. Pursuant to the Law on Planning and Construction, the conditions for the

protection of nature also need to be obtained for the elaboration of technical documents, i.e. in the procedure for the issuance of location and construction licenses.

Biodiversity of the Republic of Serbia is also a segment of the Spatial Plan of the Republic of Serbia (SPRS) (The Law on Spatial Plan of the Republic of Serbia from 2010 to 2020, "The Official Gazette of the Republic of Serbia", No. 88/2010). The SPRS states that the basic goal and principle of further development of the Republic of Serbia is the sustainable use of biological resources, with reverence of the criteria such as sustainability, quantity, usability (exploitation), endangerment, sensitivity and renewability of biological resources.

According to the SPRS, the strategic priorities of spatial development of the Republic of Serbia until 2014 in terms of biodiversity are a decrease in the losses in biodiversity, the reduction of pressures exerted on biodiversity and the establishment of a system for the protection and sustainable utilization of biological resources. The concept of development of the protection of biodiversity of the Republic of Serbia in SPRS will be implemented within the protected areas, within the framework of the protection of strictly protected and protected wild species, the conservation of habitats with national and international significance and the establishment of an ecological network.

The basic measures and instruments for the incitement of the development, regulation, protection of biodiversity and utilization of biological resources pursuant to the SPRS are: the completion of elaboration, the development and implementation of relevant national strategic documents, the implementation and realization of relevant international agreements and documents, financial-incentive measures and benefits, the elaboration of individual action plans for the protection of endangered species and the elaboration of Red lists and Red books of endangered plant and animal species.

The vision of spatial development, which has been defined in the SPRS, is achieved through the realization of strategic developmental priorities until 2014-2015. The programme for the implementation of the SPRS for the period from 2011 to 2015 represents a support to the realization of strategic priorities, as well as the framework for the monitoring and evaluation of the realization of the SPRS through indicators of spatial development and construction and the utilization of an information system for planning and development.

The annual report on the implementation of the SPRS and the state of spatial development is prepared and published with a basic goal to create a platform for the efficient enactment of realistic, timely and harmonized decisions on the future development of the Republic of Serbia, through measurement of values and certain indicators and the identification of the status of the planned strategic development projects.. In order to prepare this report, the institutions which are competent for the protection of nature regularly deliver evaluations of the degree of realization of the following strategic priorities:

- Priority No. 17: "Increase in the total protected surface to 10% of the territory of the Republic of Serbia through proclamation of new protected areas";
- Priority No. 18: "Revision of the status (types, categories, regimes and protection borders) of previously proclaimed protected areas and harmonization with valid legal regulations";
- Priority No. 19: "Implementation of the Ramsar Convention, i.e. preparation of documents and other activities regarding entry into the Ramsar list";
- Priority No. 20: "Preparation of documents and activities regarding the nomination of areas for the List of biosphere reserves within the Man and Biosphere programme";
- Priority No. 21: "Nomination of UNESCO's World Heritage sites";

• Priority No. 22: "Establishment of national ecological network and European ecological network NATURA 2000 and establishment of GIS".

Examples of good practice in the implementation of the Convention on Biological Diversity in the Republic of Serbia from the aspect of spatial planning, i.e. jurisdiction of the Serbian Agency for Spatial Planning (SASP)

The valid Spatial plan of the Republic of Serbia, enacted for the 2010-2020 period, processes the issue of biodiversity as a special chapter for the first time, instead of processing it within the chapter on the protection of nature. The concept of protection of natural heritage has also been determined, and it will be based not only on the increase in the total protected surface up to 12% during the planned period (until 2020), but also on the establishment of a national ecological network and the identification of the area for the European ecological network NATURA 2000, which also represents a priority activity defined by the SRPS for the given area.

The SASP has prepared and coordinated eight regional spatial plans (RSP) which also include the aspect of the protection of nature, i.e. the protection of biodiversity, in the scope stipulated by the Law on Planning and Construction.

The SASP has so far prepared and coordinated the elaboration of 38 spatial plans of special purpose areas (SPSPA), whose instruments and planning measures contribute to the conservation of spatial value, of which 14 plans have been elaborated for the protected areas which at the same time represent international centres of biodiversity in Serbia;

a) for Special Nature Reserves: Gornje Podunavlje (2012), Suva planina (2012), Zasavica (2010), Kovilj-Petrovaradin Marshes (2011), Uvac (2010), Stari Begej-Carska Bara (2009), Deliblato sands (2006) and the Obed pond (2006);
b) for Nature Parks: Golija (2009) and Stara planina (2008);
c) for National Parks: Đerdap (2013), Tara (2010), Kopaonik (2009) and Fruška gora (2004).

Among the above-mentioned Spatial Plans for Special Purpose Areas, the following SPSPAs stand out: SPSPA for the SNR Uvac, the area which is also protected based on the protection of nature, i.e. biodiversity (the habitat of *Gyps fulvus*) and based on the protection of waters (regional water source for water supply), for the NP Golija, which represents the first Biosphere Reserve (UNESCO-MaB) in Serbia and for the SNR Zasavica, as one of the Ramsar areas.

Conclusion

In general, the Biodiversity Strategy and the Action plan of the Republic of Serbia should be more significantly recognized and accepted by other sectors and competent institutions as an umbrella document whose goals and guidelines should be included in appropriate regulations and strategic documents, which would, among other things, be achieved through the harmonization of different national documents from the aspect of conservation and improvement of the state of biodiversity. Most guidelines for the conservation of biodiversity have been included into spatial plans, ranging from regional to local, and especially into spatial plans for special purpose areas.

2.6. Synergy with other conventions and regional initiatives

In the area of the protection of biodiversity, besides the UN Convention on Biological Diversity ("The Official Gazette of the Federal Republic of Yugoslavia" – International contracts, No. 11/2011), the Republic of Serbia has ratified the following:

• UN Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (UNCCD) ("The Official Gazette of the Republic of Serbia" – International contracts, No. 102/07);
• UN Framework Convention on Climate Change and Kyoto Protocol (UNFCCC) (The Law on Verification of Kyoto Ptotocol with the UN Framework Convention on Climate change, "The Official Gazette of the Republic of Serbia", 88/2007 and 38/2009);

as well as the following international biodiversity related conentions at the global level:

• World Heritage Convention ("The Official Gazette of the Socialist Federal Republic of Yugoslavia" – International contracts, No. 8/74);
• Convention on swamps with international significance, particularly, as habitats of swamp birds – Ramsar Convention ("The Official Gazette of the Socialist Federal Republic of Yugoslavia"-International contracts, No. 9/77);
• Convention on International Trade in Endangered Species of Wild Fauna and Flora-CITES ("The Official Gazette of the Socialist Republic of Yugoslavia"-International contracts, No. 11/2001);
• Convention on the conservation of migratory species of wild animals- Bonn Convention ("The Official Gazette of the Republic of Serbia"-International contracts, No. 102/07);

At the European level, Serbia has ratified:
• The Convention on the Conservation of European Wildlife and Natural Habitat ("The Official Gazette of the Republic of Serbia"-International contracts, No. 102/07);
• The Framework Convention on the Protection and Sustainable Development of the Carpathians (Carpathian Convention) ("The Official Gazette of the Republic of Serbia"-International contracts, No. 102/07); with protocols on biological diversity, forests and tourism.

Besides the conventions, synergism is also realized through the EU Strategy on Biological Diversity, Pan-European Biological Diversity Strategy and the global Platform for Biodiversity and Ecosystem Services.

Within the fulillment of obligations which the Republic of Serbia has accepted pursuant to the Bern Convention**,** during the period from 2011 to 2013 several thematic reports have been submitted:

- Reports of signatory countries of the Bern Convention on measures taken for the realization of the recommendation No. 155 (2011) of the Standing Committee on the illegal killing, trapping and trade of wild birds.

For the purposes of the preparation of the European conference on illegal killing of birds (Cyprus, 2011), in order to identify potential options and strategies for the resolution of this matter, in 2011 the ministry which is competent for the implementation of the Bern Convention, provided a general overview of the most important mechanisms for the implementation of the law in Serbia regarding illegal activities which relate to killing and trapping of birds, primarily representatives of *Accipitridae* and *Fringillidae* families. These

birds are most often killed during hunting, because since they are predators, they are considered as pests, although they are strictly protected. Serbia does not have a developed system for recording killed birds, as well as a database on trapped and killed birds. The control is performed via hunters' associations and state inspections, and institutes for the protection of nature have partial information. As for the export, there are nine official border crossings with an established system for export, import, trade and turnover of protected and strictly protected wild bird and animal species.

- The report on the implementation of Recommendation 120 (2006) on the European strategy for the conservation of invertebrates in Serbia

According to the report of the competent ministry from 2011, several projects, strategies and policies have been initiated regarding this issue, in order to establish a system for research and establishment of a system for monitoring invertebrates. The following are the factors which have a negative influence on invertebrate populations: agricultural activities, wood cutting, abandonment of agricultural land, isolation of natural habitats, total felling, tourism and recreation, drainage, urbanization, collection of waste, chemical pollution. The upgraded Report was prepared in 2013.

- The Report for Serbia on the implementation of Recommendation 136 (2008) on the promotion of protection of the hamster (*Cricetus cricetus*) in Europe.

The report was prepared in 2011 by the ministry competent for the implementation of Bern Convention in Serbia. In Serbia, activities have been initiated within several projects, strategies and policies, in order to take the necessary steps for the conservation of wild populations and natural habitats of this species, which is included in the list of strictly protected wild species at the national level.

- The Report for Serbia on Recommendation No. 132 (2007) of the Standing Committee for the Conservation of Fungi in Europe – the report was prepared in 2011 and contains strictly protected fungi species pursuant to the Law on Nature Conservation, the list of fungi which are subject to the Law on Turnover and Trade in Wild Flora and Fauna Species, as well as the proposal of fungi species to be included in the Red list of fungi in Serbia.

- The Report for Serbia on Recommendation No. 132 (2007) of the Standing Committee for the Conservation of Fungi in Europe

The report was prepared in 2011 and includes a list of strictly protected fungi species which have been put under protection pursuant to the Law on Nature Conservation, the list of fungi protected by the control of the collection, utilization and trade pursuant to the Decree on the Control of Utilization and Trade in Wild Flora and Fauna, and a proposal of species to be included in the Red list of fungi in Serbia has been made.

- The Report on the implementation of Recommendation 154 (2011) on the European Code of Conduct for vermin and entered invasive species in Serbia

In the report submitted in 2013 by the Ministry of Energy, Development and Environmental Protection, which is responsible for monitoring the implementation of Bern Convention in Serbia, a positive evaluation has been given for the integration of Recommendation 154

(2011) into sectoral policies, strategies and legislation, including the obligations which Serbia has accepted within the implementation of international agreements and documents. Cooperation with relevant institutes, institutes for the protection of nature and the Ministry of agriculture, forestry and water management has been established, and realization of several important projects has been started, or they are currently in the phase of the development of monitoring and research on invasive species in Serbia.

In 2012, Serbia submitted **The Second National Report on the Implementation of the Cartagena Protocol on Biological Safety,** with the Convention on Biological Diversity.

Pursuant to this Report, Serbia (then a part of the Federal Republic of Yugoslavia) had an established legal framework for biological safety since 2002, which was then comprised of the Law on Genetically Modified Organisms (GMO) ("The Official Gazette of the Federal Republic of Yugoslavia", No. 24/2001), The Rulebook on Limited Utilization of GMO" ("The Official Gazette of the Federal Republic of Yugoslavia", No. 62/2002), the Rulebook on the Introduction of GMO and GMO Products into Production ("The Official Gazette of the Federal Republic of Yugoslavia", No. 62/2002), The Rulebook on the Release of GMO and GMO Products ("The Official Gazette of the Federal Republic of Yugoslavia", No. 62/2002). With Changes to the Law on Genetically Modified Organisms ("The Official Gazette of the Republic of Serbia", No. 41/2009), Serbia introduced a general prohibition of commercial cultivation of genetically modified organisms (GMO) and the release of GMO and GMO products. It has also been established that the legal regulations in this area have to be changed and harmonized, bearing in mind the fact that this area is also covered by the Law on Food Safety ("The Official Gazette of the Republic of Serbia", No. 41/2009). The Law on GMO also established the Expert Council for Biological Safety (former National Council for Biological Safety), which has jurisdiction over the consideration and issuance of opinions on applications for the use of GMO, as well as proposals of changes in legal regulations in this area. The Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia was in charge of the implementation of the Law, and during 2013, it announced the need to change the Law on GMO from 2009 due to it not being safe, and based on a unanimous opinion of the National Council for Biological Safety from 2009[4]. Since 2014, the Ministry of Agriculture and Environmental Protection is the Ministry in charge of this area.

The National Report on the Implementation of **the Convention on the Conservation of Migratory Wild Animal Species (the Bonn Convention)** was submitted in May, 2014, by the Ministry of Energy, Development and Environmental Protection of the Republic of Serbia. In the Biodiversity Strategy, protection of migratory species is included into the research and monitoring activities related to migratory species and cross-border cooperation, in the sense of coordination with other international instruments for the protection of biodiversity, i.e. into the process of creation of mechanisms, the enactment of acts and instruments for the harmonization and implementation of multilateral international agreements which are related to biodiversity.

Within the project "Planning of Conservation of Biodiversity at the National Level as a Support for the Implementation of the Strategic Plan of the Convention on Biological Diversity for the Period from 2011 to 2020 in the Republic of Serbia", an initiative for the coordination during the elaboration and update of the Strategy of Biodiversity for the Western Balkan countries has been launched. The purpose of this initiative is that the regional

[4] http://www.mpzzs.gov.rs/vest/9061/Постојећи-Закон-о-генетски-модификованим -организмима-није-безбедан-неопходна-је-његова-промена.

countries define in their national Strategies the goals and/or activities which are related to regional cooperation, in order to institutionalize and enhance regional cooperation, improve the exchange of experience and open new possibilities for work and the implementation of activities for the protection of nature. The initiative was supported by the ministries of the Western Balkan countries which are competent for the protection of nature and biodiversity, as well as the UNDP and UNEP. Until now, three regional meetings have been held, starting points and further activities have been agreed, among which is the organization of a joint accompanying event at the twelth meeting of the Convention member countries.

The **"Big Win for Dinaric Arc"** is an initiative which was created in 2008, when the document with the same name was jointly signed by the ministers from six countries who are competent for the area of the environment and the protection of nature, during the 9th Conference on Biodiversity (CBD COP 9), which was held in Bonn, Germany. By taking participation in this initiative, representatives of governments of Albania, Bosnia and Herzegovina, Croatia, Montenegro, Serbia and Slovenia announced their intention to proclaim 13 new protected areas and increase the nine already-existing protected areas, and they have also prepared national proposals of activities in support to the implementation of the goals of CBD Program for work in protected areas. The aim of the Initiative is to establish a representative network of protected areas with good management through countries that belong to the Dinaric Arc, which would create a basis for long-term cooperation that would also enable the improvement of local and national economy.

At the end of 2013, the signatory countries of the Dinaric Arc, which were joined by FYR Macedonia and Kosovo*, and supported by the WWF, the Ministry of Sustainable Development and Tourism of Montenegro and the IUCN, signed the document via which all the countries accepted the obligation of further joint work on the improvement of protected areas. The countries obliged to work on strengthening of the planning process regarding the protection of nature and the evaluation of economic value of their natural riches, by integration of the goals of the protection of nature into plans for the economic development in fishing, forestry, agriculture, energy, spatial planning and through a more intense intersectoral cooperation, during the next five years. One of the goals is also the identification of a model for sustainable financing of protected areas in the region, which also includes development plans for sustainable tourism.

Within the activities for the implementation of **the Convention on Cooperation for the Protection and Sustainable Use of the Danube River,** Joint Danube Survey 3 – JDS3 was realized. This is the largest international river research action realized in 2013, and it was proclaimed by the United Nations as the year of international cooperation in the area of waters. The research action gathered 14 countries along the Danube in cooperation with the European Committee, and the realization of research was coordinated by the International Commission for the Protection of the Danube River – ICPDR. The research was performed on the flow of the Danube River from Regensburg in Germany to the Danube River delta, through 10 countries and for the total length of 2375 km, during the period from August until September, 2013. Twenty members of an international scientific team from Austria, Slovakia, Hungary, Serbia, Croatia, Romania and Bulgaria were given the task to take samples of water, sediment, biological samples, suspended matter and fish, to analyse the physical-chemical parameters, hydro morphological characteristics, to monitor plants and animals and to perform other research activities (http://www.danubesurvey.org/).

Together with Serbian experts, a boat-laboratory "Argus" was included in the expedition; it was donated to Serbia in 2003 by the Government of the German Province Hessen for the sampling and examination of water, sediment and biota along the flow of the Danube River and its navigable tributaries.

The Joint Danube Survey 3 contributes to the increase of awareness of the general significance of water protection, as well as the significance of cooperation between the Danube countries regarding the management and sustainable development of the Danube River basin. The obtained results will be entered into the next Management Plan for the Danube River Basin, which will help the elaboration of the Joint Program of Measures, which should be adopted by the International Commission for the Protection of the Danube River until the end of 2015, in order to fulfill the obligations from the Convention on the Protection and Sustainable Use of the River Danube and the European Union Water Framework Directive.

The Serbian Agency for Spatial Planning participated in the international projects "The Concept of regional cooperation in the area of spatial planning and development in the Danube basin region – Donauregionen" (INTERREG IIIB CADSES NP, 2006-2008) and "The Concept of regional cooperation in the area of spatial planning and development in the Danube basin region – Donauregionen+" (Transnational Cooperation Programme South East Europe – SEE, 2009-2012), whose main goal is the formulation of joint strategy for spatial development of the Danube regions. The following were stated as its special goals: the empowerment of the Danube River as a significant European corridor, support to the growth and competitiveness of functional regions and the elaboration of integral developmental strategies of the Danube regions. Within the project, the aspect of the protection of nature and the protection of biodiversity was processed, and the project results indicated that the quality of the Danube River is lower at its entrance into the country than in its exit from the country.

Also, based on the Decision on the Elaboration of the Spatial Plan for the Special Purpose Area of the International Waterway E80-Danube (the Pan-European corridor VII) "The Official Gazette of the Republic of Serbia", No. 3/2010), the SASP was the bearer of the elaboration of the Plan, during which it was determined that "Serbia is one of the rare Danube countries in whose territory the quality of the Danube River water becomes improved, which is also indicated by the measurements performed by the Republic Hydrometeorogical Service of Serbia. At the entrance into Serbia, the quality of water belongs to III/IV class or is "not classified", and at the exit from Serbia it belongs to IIa and IIb class.

2.7. The evaluation of progress in the implementation of the Biodiversity Strategy of the Republic of Serbia and Action plan for the period 2011-2018

During the period from 2011 to 2013, certain measures for the realization of activities for the achievement of the goals established in the Biodiversity Strategy have been implemented by state institutions, civil society organizations, local administrations and other entities. The preliminary analysis of the Questionnaire on the evaluation of progress in the implementation of the Biodiversity Strategy of the Republic of Serbia and the Action plan for the period from 2011 to 2018 in relation to the set goals determined that the largest number of measures was implemented in the realization of activities which relate to the fulfillment of *strategic goals* – biodiversity conservation and protected areas system. Most of the envisaged activities have been started or are being currently implemented, except for the activity which is related to the

implementation of national analysis of sensitivity to climate change through the utilization of the existing geographically explicit models for the evaluation of sensitivity of inland and fresh water ecosystems to climate change. The measures for the implementation of activities which relate to financing of protected areas have not been elaborated sufficiently.

Within the strategic area of the **CONSERVATION OF BIODIVERSITY** and individually displayed objectives, some of the more significant measures that have been taken are the following:

OBJECTIVE 1.1. Enable sustainability of endangered species and ecological communities in their natural habitats because of genetic variety and potentials for evolutional development. Renew biological diversity in degraded areas. Amend in-situ measures for conservation through maintenance of ex-situ locations and implementation of ex-situ measures for conservation.

- The Rulebook on the proclamation and protection of strictly protected and protected wild plant, animal and fungi species have been revised, together with lists of the above-mentioned species ("The Official Gazette of the Republic of Serbia", No. 5/2010 and 47/2011);
- The state of the population of individual endangered species, habitats and ecosystems is being monitored within the protected areas in conformity with medium-term plans and annual management programs, and measures for the protection of species habitats and certain habitat types have been taken;
- In the sector of forestry, in conformity with the principles of FSC forest certification, obligatory monitoring of rare, endangered and vulnerable species is performed by users and/or managers of the areas (via the keepers service), and its character is more professional than scientific;
- Measures for active protection of species in protected areas and outside of these areas, such as the setup of artificial nests for *Coracias garrulus, Aquila heilaca, Falco cherrug* species, management of habitats (*Paeonia officinalis* subspecies *banatica*) and other;
- An electronic database on the presence of plant species in Serbia, scientific, doctorate, graduate and other works on flora and vegetation has been formed within the information system, as well as an internal herbarium base for the needs of management of botanical herbarium of the Institute for Nature Conservation of Serbia;
- Within the project "*Ex situ* protection of biodiversity of aquatic ecosystems in Serbia" of the Faculty of Mathematical Sciences from Kragujevac, an internet database on BAES – Biodiversity of Aquatic Ecosystems of Serbia has been created, techniques, procedures, protocols and methods of *ex situ* protection of endangered species and other aquatic organisms have been defined, as well as the development of the information system of *ex situ* protection at the national, regional and international level. The database contains data on the presence and distribution of macro algae, macro invertebrates and fish in Serbian inland waters based on bibliographic data and research data, data on the categorization of species endangerment based on the IUCN categories and information on species which require *ex situ* protection. The database also enables connection with international databases such as *EUNIS, Fauna Europaea, FishBase, Algaebase,* and other;
- Based on the identified types of habitats and protected species which have been stated in the Rulebook on the Criteria for the Differentiation of Types of Habitats, on Types of Habitats, Sensitive, Endangered, Rare Types of Habitats, Types of Habitats Which Represent a Priority Regarding Protection and on the Protection Measures for Their Conservation ("The Official Gazette of the Republic of Serbia", No. 35/2010) and the Rulebook on the

Proclamation and Protection of Strictly Protected and Protected Wild Plant, Animal and Fungi Species ("The Official Gazette of the Republic of Serbia", No. 5/2010 and 47/2011) in 2014, terms of reference have been prepared for the launching of the Natura 2000 Project via IPA 2012 funds, which will, among other things, include the mapping of types of habitats and species according to the EU Directives on Habitats and Birds;

- Each year, the Order on the Prohibition of Collection of Individual Protected Wild Flora and Fauna Species ("Official Gazette of the Republic of Serbia", No. 24/2011, 24/2012, 21/2013, 23/2014) is being enacted and it refers to the complete territory of Serbia, or to areas of individual administrative districts;
- Within the continuous inspection and expert monitoring for the purpose of controlling unauthorized keeping of protected animal species in imprisonment by natural persons, in pet shops, breeding houses and at border crossings, they are taken and managed for in zoos or shelters for wild species,
- A draft of the National programme for the conservation of plant genetic resources for food and agriculture and the Action plan (2014-2020) have been elaborated with the support provided by FAO;
- Within the newly-established Centre for the conservation of biodiversity and fresh water fishing, which is located within the Aquarium at the Faculty of Mathematics and Natural Sciences in Kragujevac, the formation of a gene bank of aquatic gametes and cryopreservation of spermatozoids of individual fish species under laboratory and field conditions has been started.

OBJECTIVE 1.2. Monitor, regulate and decrease the influence of the processes and activities which have or will probably have a significantly unfavourable impact on biological diversity

- Bearing in mind that article 83 of the Law on Nature Conservation defines the prohibition of introducing allochthonous wild species and their hybrids into free nature in the territory of the Republic of Serbia, within the Biodiversity Strategy, administrative, scientific and technical activities have been identified for the management of these processes. This implies identification of indicators for monitoring the states of introduced foreign species and their influence on biodiversity, development of biological and other measures for the control and elimination of invasive allochthonous species, establishment of control over breeding centres for exotic species, animal marking and prohibition of import of exotic species which can become invasive, establishment of a warning system for invasive species and the procedure for the reaction to the threats caused by these species;
- The Ministry of Agriculture, Forestry and Water Management has launched a project named "Mapping and monitoring of invasive species in agro-ecosystems", and mapping of allochthonous invasive plant and animal species is also performed by the institutes for the protection of nature and scientific research institutions. The Department for biology and ecology of the Faculty of Mathematics and Natural Sciences, University of Novi Sad, in the period from 2010 to 2011, realized a project named "List of invasive species in the territory of the Autonomous Province of Voivodina", which was financed by the State Fund for Environmental Protection. Within the above-mentioned project, a database of invasive species of algae, fungi, plants invertebrates and vertebrates has been created, containing basic information on their biology, ecology and distribution http://iasv.dbe.pmf.uns.ac.rs/index.php?strana=baza. In 2012, Institute for Nature Conservation of Serbia created a preliminary list of invasive plant, amphibian, reptile, mammal and bird species in the Republic of Serbia, together with general measures for their control and suppression, whose primary goal is to create a basis for the elaboration of a future

sublegal act which will elaborate the problem of invasive species in more detail (Lazarević et al, 2012).

- A Study on spatial differentiation of the environment on the territory of the Autonomous Province of Vojvodina has been enacted in order to identify the most endangered localities. The study is significant as a starting point for all strategic activities in the space, for planning and finding compromises between individual sectoral interests. The study considers areas and localities of degraded environment, zones of negative influences and endangered areas from a spatial aspect;
- The Rulebook on the National list of environmental protection indicators ("The Official Gazette of the Republic of Serbia", No. 37/2011) have been enacted;
- Monitoring of the soil quality on the territory of AP Vojvodina, which has been implemented since 2002, includes monitoring of chemical, radiological and biological indicators of individual geomorphologic units within agricultural land and non-agricultural land in industrial zones of major cities and protected natural goods;
- Within the scientific research project of the Ministry of Education, Science and Technological Development named "Evolution in heterogeneous environments: mechanisms and adaptations, bio monitoring and conservation of biodiversity" (2011-2014), which is realized by the Institute for Biological Researches "Siniša Stanković" and the Faculty of Biology, University of Belgrade, the Faculty of Mathematics and Natural Sciences from Kragujevac and the Faculty of Mathematics and Natural Sciences from Niš, evaluations of the influence of invasive species and climate change, as well as the development of bio indicators for monitoring the influence of pollution on biological diversity.
- The Twinning project "Enhancing Administrative Capacities for Protected Areas in Serbia (Natura 2000)" includes pilot plans for the management of Special Nature Reserve "Obed pond" or the period until 2020, and the "Tara" National Park, as potential Natura 2000 areas, and these plans serve as guidelines for the protection of nature. Press conferences and support to eco campaign "Stop Poisoning Birds of Prey" have been organized with the support of "Vojvodinašume" public enterprise from Novi Sad, in order to raise awareness of the public about the importance of decrease of negative influences of agricultural poisons on biodiversity, and the result of the above-mentioned actions was the withdrawal of toxic pesticide Furadan from use;
- In order to prevent the occurrence and efficiently extinguish fire forests, the Strategy for fire protection for the period from 2012 to 2017 ("The Official Gazette of the Republic of Serbia", No. 21/2012) has been created;

Within the strategic area of **PROTECTED AREAS SYSTEM**, some of the more significant measures that have been taken in relation to individually displayed objectives are:

OBJECTIVE 2.1. Establish and manage an all-encompassing, adequate and representative protected areas system, which includes biodiversity of the Republic of Serbia

- The Law on Spatial Planning of the Republic of Serbia from 2010 to 2020, the Regional spatial plan of the Autonomous Province of Vojvodina until 2020, the Medium-term programme for the protection of natural resources 2011-2020 and the Annual programme for the protection of natural resources of the Institute for Nature Conservation of Serbia and the Institute for Nature Protection of AP Vojvodina, envisage an increase of surfaces under protection;
- There is a total number of 474 protected areas stretching over the surface of 531279 ha, which represents 6% of the territory of Serbia, whereas additional 2.28% of the territory is in the process of protection (the Institute for Nature Conservation of Serbia, 2014);

- By connecting the protected areas, ecologically significant areas and corridors which are important for the conservation of biodiversity, an ecological network has been formed (The Rulebook on the Ecological Network, "The Official Gazette of the Republic of Serbia", No. 102/2010), containing 101 areas stretching over a total surface of about 20% and the planning, landscaping and use of this space is performed in accordance with the measures and conditions for the protection of nature;
- The Draft of the Action plan for establishing the Natura 2000 ecological network in the Republic of Serbia for the 2011-2020 period has been created;
- Within the project "Implementation of principles of sustainable use of areas which are significant for the conservation of biodiversity within the ecological network in AP Vojvodina", the information system of the Provincial Institute for Nature Protection has been expanded with an application named "Ecological network" in order to form a database with geographical reference;
- Expert support to managers in the realization of educational programmes for rangers for protection and presentation of natural values is realized during consultations and cooperation between managers, competent ministries and other state and provincial institutions, via organization of expert gatherings, counselling and conferences on the promotion of management practice regarding natural values;

OBJECTIVE 2.2. Provide availability of financial funds for the maintenance and expansion of the protected areas system in the Republic of Serbia, together with the strengthening of long-term financial sustainability of the system

- Within the UNDP/GEF project "Ensuring financial sustainability of the protected area system of Serbia", a financial analysis of individual protected areas has been performed in cooperation with the managers of the protected areas, as a basis for the elaboration of the Plan for sustainable financing of protected areas system in Serbia;
- A financial analysis of protected areas on the territory of AP Vojvodina is implemented at the beginning of the calendar year in order to identify the amounts required for co-financing of project activities;
- Financial plans are enacted in conformity with medium-term plans and annual management programmes

Strategic area number 3, which relates to **SUSTAINABLE USE OF BIODIVERSITY, THE APPROACH AND ALLOCATION OF PROFIT AND THE ECONOMIC EVALUATION,** has not been specifically implemented, due to the underdeveloped system for the evaluation of biodiversity and ecosystem services in Serbia.

The aspect of valorisation of ecosystem services in protected areas was initiated in 2014 with the project "Benefits of ecosystem services of the Đerdap National Park for the Local Community", with the aim of adopting and adjusting the methodology which will be implemented in other areas and sectors during the following period;

OBJECTIVE 3.1. Develop new and strengthen the existing mechanisms in order to secure sustainable use of biodiversity in the Republic of Serbia. Promote these mechanisms within the public and private sectors

- The National strategy for sustainable use of natural resources and goods ("The Official Gazette of the Republic of Serbia", No. 33/2012) has been adopted;

OBJECTIVE 3.2. Ensure that social and economic benefits from the use of genetic resources and other products and services of biodiversity remain within the Republic of Serbia

- Seminars have been held within the FAO project "Support to the National Programme for the Conservation of Plant Genetic Resources in Serbia", among others, on the subject of the concept of the approach to plant genetic resources for food and agriculture;
- In 2011, the Nagoya Protocol (The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity) was signed, with the aim of its ratification by 2015, and the state is also participating in the work of Intergovernmental Committee for the Implementation of the Nagoya Protocol;

OBJECTIVE 3.3. Increase national awareness and utilization of methods for economic evaluation of biodiversity for the purpose of a more precise evaluation and calculation of the economic benefit from the protection of biodiversity in comparison with the activities which lead to the loss of biodiversity

- The project "Socio-economic benefits of Natura 2000", within which civil society organizations promoted ecosystem services and methods of evaluation, has been realized with the aim to influence the raising of awareness of decision-makers and the business sector on the scope of economic values of biodiversity, as well as the methods for the evaluation of these values;
- Within the project "Implementation of principles of sustainable use of the areas which are significant for the conservation of biodiversity within the ecological network in the Autonomous Province of Vojvodina", informative material has been prepared regarding sustainable land use and promotion of the ecological network, which presents the notion and significance of ecosystem services in a popular manner. The material is intended for interested parties (water management, forestry, agriculture, hunting and rural development);

Mechanisms for the economic evaluation of biodiversity, natural areas and ecosystem services and the integration of these values into national policies, plans, budgets and strategies in relevant sectors have not been established so far.

Strategic goal number 4, which relates to **POLITICAL, LEGISLATIVE, INSTITUTIONAL AND FINANCIAL FRAMEWORKS FOR THE CONSERVATION OF BIODIVERSITY** has not been realized sufficiently within the period from 2011 to 2014, especially due to the changes which occurred in the structure of the ministries in charge of environmental protection, which particularly reflected on the decrease of the allocation of financial funds for this area. For the sector of environmental protection, only 0.4% of the gross domestic product has been allocated, i.e. 0.9%, if we also observe the contribution made by the industrial and private sectors, as well as the contribution made on the local level.

OBJECTIVE 4.1. Strengthening and expansion of frame of policy for the conservation of biodiversity

- Through issuance of the conditions for environmental protection during the elaboration of spatial plans for special purpose areas, regional spatial plans and other spatial-planning documents, projects and programs for the construction of objects and the realization of various activities in space, as well as through issuance of opinions on spatial and urban plans,

forest and other bases and programs, studies on the evaluation of influence, strategic evaluations of influence, legal regulations, strategic documents, etc.;
- Measures for the conservation of forests and prohibition of change of intention (the Law on Forests, "The Official Gazette of the Republic of Serbia", No. 30/2010);
- Measures for the protection, conservation and improvement of natural values during elaboration of studies for the protection of areas, as well as in the process of elaboration of acts (regulations, decisions) on their proclamation as protected areas;

OBJECTIVE 4.2. Strengthen the legislative framework for the conservation of biodiversity and secure the implementation and harmonization of legislation which refers to biodiversity

- Within the Twinning project "Enhancing administrative capacities for protected areas – Natura 2000" (2010-2012), an evaluation of the harmonization of the national legislative framework with the EU legislation has been made,
- The ministry which is in charge of agricultural operations performs regular work on the evaluation of legislative mechanisms for the preservation of agrobiodiversity in relation to the legislative framework of the EU;
- Changes and amendments to the Law on Environmental Protection, the Law on Nature Potection and the Decree on the Ecological Network are currently in the procedure;

OBJECTIVE 4.3. Strengthen the institutional framework for biodiversity conservation

- The functional review of the sector for biodiversity conservation has not been published and clear and detailed institutional competences and policies have not been created

OBJECTIVE 4.4. Strengthen and expand the financing of the conservation of biodiversity and provide incentives for the conservation of biodiversity within all sectors

- During preparation of the Action plan for the realization of priorities for the Development programme of AP Vojvodina 2014-2020, the activities and sources of financing for the projects in the area of environmental protection have been stated;
- In conformity with the Law on Incitements in Agriculture and Rural Development ("The Official Gazette of the Republic of Serbia", No. 10/2013), the Rules on Incentives for the Conservation of Animal Genetic Resources ("The Official Gazette of the Republic of Serbia", No. 83/2013) and the Rules on Incentives for the Conservation of Plant Genetic Resources ("The Official Gazette of the Republic of Serbia", No. 85/2013) have been enacted;

The fifth strategic area which relates to the **INTEGRATION OF THE CONSERVATION OF BIODIVERSITY INTO OTHER SECTORS** is the goal which has been met to the largest extent in the sectors of forestry and spatial planning, through the implementation of the conditions for the protection of nature and the data on natural values, protected areas, ecologically significant areas and corridors (the ecological network) in spatial plans and through certification of highly valuable forests. There is no available data for the sectors of mining and energetic.

OBJECTIVE 5.1. Create and implement integrated policies for the conservation and sustainable utilization of biodiversity on the national level

- In the procedure for issuing the conditions for the protection of nature for sectoral activities (forestry, management of natural resources, agriculture, management of water resources,

tourism and recreation, spatial planning, transport, mining, energy), an assessment is performed regarding whether the planned works and activities can be realized from the standpoint of objectives of the protection of nature and enacted regulations and documents;
- For the areas which, due to natural, cultural-historical or ambient values, exploitation of mineral raw materials, utilization of touristic potentials, hydrological potentials or construction of objects, require a special regime of organization, landscaping, utilization and protection of areas, or the area which has been defined as such by the Law on Planning and Construction ("The Official Gazette of the Republic of Serbia", No. 72/09, 81/09 – correction, 64/10 - CS, 24/11, 121/12, 42/13 - CS, 50/13 – CS and 98/13 – CS);

OBJECTIVE 5.2. Integration of biodiversity into all relevant sectors

- The Draft of the National programme for the conservation and sustainable use of plant genetic resources has been created;
- The Draft of the National Action plan for the development of organic agriculture has been made in cooperation with the German Organization for International Cooperation (GIZ);
- The Draft of the Strategy for agricultural and rural development (2014-2020) has been created;
- "Srbijašume" and "Vojvodinašume" public enterprises implement the certification of forests according to the requirements of FSC (Forest Stewardship Council) standards i.e. they manage forest resources in a responsible manner, through improvement of work methods and the development of responsibility for the management of forest resources, taking into consideration that management is being realized in a manner which is ecologically acceptable, socially righteous and economically profitable;
- In conformity with the Law on the Protection and Sustainable Utilization of Fish Stocks ("The Official Gazette of the Republic of Serbia", No. 36/2009), medium-term and annual programs are created for the management of fishing areas, which contain the basic information on the qualitative and quantitative composition and age structure of fish stocks, biomass, the production and pressure exerted by fishing onto fish stocks.
- In Vojvodina, the users of the basic canal network of the hydro system Danube-Tisza-Danube have realized projects on the maintenance of the water regime of alkaline lakes and steppe lakes, and the provision of flooding of wet meadows by mowing and removal of aquatic vegetation;
- The Provincial Institute for Nature Conservation, in cooperation with the Urban and Spatial Planning Institute of Vojvodina, participates in the elaboration of spatial plans for special purpose areas – the elaboration of post studies of the state of nature conservation, the conservation of biodiversity and the protection regime – within the natural goods of Special Nature Reserves Zasavica, Slano Kopovo, Koviljsko-Petrovaradinski rit and the protected areas in the vicinity of Subotica, within the spatial plan for the special purpose area Subotička jezera i peščare and a multifunctional ecological corridor of the Tisza River, via an elaboration of expert-documentary basis in the field of the protection of nature and the definition of measures for the protection of the corridor and the protection zone;
- The application for the Europarc Charter for Sustainable Tourism in SRP "Gornje Podunavlje" (2014) has been prepared.

Strategic area number 6 which relates to the **KNOWLEDGE DATABASE AND CREATION OF A NATIONAL INFORMATION SYSTEM FOR BIODIVERSITY** is at the beginning of its realization. The activities have been taken regarding the definition of the plan and the programme of work of the Biodiversity Information Centre, located at the Faculty of Biology, University of Belgrade, objectives have been defined and an adequate

model from more developed countries, which could be adjusted to conditions and needs in Serbia, is being searched for. More significant funds are necessary for the initiation of the whole system. The existing databases (databases of the Agency for Environmental Protection and the Institute for Nature Conservation, the BAES of the Faculty of Mathematics and Natural Sciences in Kragujevac, the interactive portal BioRaS of the Consortium of civil society organizations for mapping and monitoring of biodiversity of Serbia, the List of invasive species of the Department for biology and ecology of the Faculty of Mathematics and Natural Sciences from Novi Sad, and other) are not networked, and some of them have not been active continuously. The project for establishment of Natura 2000 also envisages the provision of infrastructure for the establishment of a central database for Natura 2000.

OBJECTIVE 6.1. Collect, examine and unite available data and information on biodiversity in order to provide a basis for the evaluation of the state, for the monitoring, conservation and sustainable utilization of biodiversity

- The web portal CHM (Clearing House Mechanism) has been established by the then Ministry of Environment and Spatial Planning and the Agency for Environmental Protection;
- The Rules on the National List of Environmental Protection Indicators have been created ("The Official Gazette of the Republic of Serbia", No. 37/2011)
- The National Information Sharing Mechanism - NISM for plant genetic resources has been established within the FAO project for technical cooperation;
- BAES database of aquatic systems of the Faculty of Mathematics and Natural Sciences in Kragujevac;
- BioRas database of the Consortium of civil society organizations for mapping and monitoring of biodiversity in Serbia;
- The sector of forestry, hunting and fishing has been partially integrated within the National list of indicators;
- GIS system has been developed for protected areas (borders and protection regimes) which are managed by "Srbijašume" and "Vojvodinašume" public enterprises and it is also being filled with other relevant data related to biodiversity (locations of nests, mapping of individual species, and other).

OBJECTIVE 6.2. Establish a national programme which will identify and monitor priority species, habitats and genetic components of biodiversity, as well as the causes and consequences of activities and processes that endanger the components of biodiversity

- The development of a system for monitoring the state of agricultural genetic diversity has been started.

OBJECTIVE 6.3. Provision of support to understanding and conservation of biological diversity in the Republic of Serbia

- Research priorities in environmental protection and climate change, within which the monitoring of ecosystems and protection of biodiversity are included; have been stated in the Strategy for Scientific and Technological Development of the Republic of Serbia for the period from 2009 to 2014. Since 2011, a new project cycle for financing national scientific research projects has been started within the programme for Basic research, Technological development and Integral interdisciplinary research. The Ministry of Education, Science and Technological Development is currently financing 12 national projects within the programme for basic research in the area of biology, 5 projects within the programme of technological

development in the field of biotechnology and 2 programmes for technological development in the field of integral interdisciplinary research, environmental protection and climate change (Table 24). These projects deal with problems of protection and conservation of biodiversity in the Republic of Serbia from different aspects (protection of species, protection of habitats, ecophysiological adaptation, conservation of genetic potential, agrobiodiversity and other) and levels of organization of model organisms (molecular, population). In terms of international cooperation, agreements have been signed with Belarus, Germany, France, Italy, China, Slovenia, Slovakia, Portugal, Spain and Croatia, within the Programme for bilateral cooperation.

Table 24. Scientific research projects on the protection and conservation of biodiversity of the Ministry of Education, Science and Technological Development for the time period from 2011 to 2014

Basic research / Biology
Conservative strategy for the conservation of protected and strictly protected species in Serbia – wasp-like flies (Insecta: Diptera: Syrphidae) as model organisms
Molecular mechanisms for plant response to abiotic stress-role of transcription factors and small RNA and an analysis of genetic diversity of plant cultures which are significant for agriculture and biotechnology
Evaluation of ecophysiological and genetic plant diversity in forest ecosystems
Gene fund dynamics, genetic and phenotype variability of population depending on variability of the environment
Ecophysiological adaptive plant strategies under conditions of multiple stress
Physiological, chemical and molecular analysis of diversity of selected rare and endangered plant species for the purpose of ex situ protection and production of biologically active compounds
Evolution in heterogeneous environments: adaptation mechanisms, biomonitoring and conservation of biodiversity
Biodiversity of plants in Serbia and the Balkan Peninsula – evaluation, sustainable use and protection
Ontogenetic characterization of phylogeny of biodiversity of amphibians and reptiles of the Balkans: evolutional aspects and conservation
Fish as bioindicators of the quality of open waters in Serbia
Study of microbiological diversity and characterization of useful environmental microorganisms

Technological development / Biotechnology
Improvement of technology for cultivation of feed crops in plough land and lawns
Organic agriculture: Improvement of production through implementation of fertilizers, bio preparations and biological measures
Integral systems for cultivation of agricultural crops: conservation of biodiversity and land fertility
Creation and conservation of genetic potential of continental fruit
Biodiversity as a potential in ecoremediation technologies of damaged ecosystems
Technological development / Regulation, protection and utilization of waters, land and air
Sustainable management of total potential of forests in the Republic of Serbia
Integral interdisciplinary researches / Environmental protection and climate change
Agrobiodiversity and land use in Serbia: integrated evaluation of biodiversity of key groups of arthropods and plant pathogens
Research of climate change and their influence on the environment – monitoring of influence, adaptation and mitigation

- The database "Biodiversity of aquatic ecosystems in Serbia" **BAES ex-situ** contains data on findings on macro algae, macro invertebrates and fish in aquatic ecosystems in Serbia, during the period from the first bibliographic data from 1873, up to 2012. There is a *total* number of 11765 records on taxa, whereas there is a total number of 918 data on the researched aquatic habitats;
- The development of ESHIPPO model for the evaluation of priorities in the conservation of macro invertebrates and fish on the national level;
- Conservation of fish and crustaceans (tench, huchen, grayling, Mediterranean barbell, European crayfish) under *in-situ* and *ex-situ* conditions through the implementation of cryopreservation techniques. Formation of banks for genetic reproductive material (sperm) of endangered fish species and fish species which are significant for fishing.

CAPACITY BUILDING, which represents the strategic area number 7, has been mostly performed through trainings, briefings and study visits with the exchange of experience between institutions which deal with biodiversity in the EU.

- Measures have been realized for the implementation of CITES regulation (focused on judiciary and customs) and the purchase of equipment for Serbian EIONET, which has been largely unused;

- Through IPA Twinning project "Strengthening the capacities for protected areas in Serbia (Natura 2000)" during the period from 2011 to 2012, enhancing the capacities of public institutions for the transposition of EU legislation has been realized, workshops for evaluation of the existing data have been held with national experts, as well as training for GIS and a training programme which aims to enhance the capacities of other sectors;
- In 2014, a six-month IPA project "Enhancing capacities of state bodies responsible for CITES and the implementation of regulations in the area of trade with wild flora and fauna in Serbia", which is focused on enhancing capacities through a specialized training of all supervisory authorities (customs, border police, environmental inspection and other) for efficient implementation of the CITES convention and national regulations in this area;
- Hardware network for Serbian EIONET has been established between the Environmental Agency and the Faculty of Biology, University of Belgrade.

Strategic area 8, which relates to **EDUCATION, INFORMATION AND INVOLVEMENT OF THE PUBLIC,** has been primarily realized through activities of civil society organizations, Institute for Nature Conservation of Serbia and the Provincial Institute for Nature Protection.

- Professional and popular programmes for teachers and students, which promote the significance of the conservation of biodiversity, have been realized. A campaign to raise awareness of biodiversity – values, endangerment factors and protection, is implemented at a satisfactory level, and trainings on the conservation of biodiversity for hunters and fishermen, collectors of medicinal herbs, tourist organizations and other interested individuals and organizations, have been realized. Local population is included in the process of elaboration of studies on protection even before an area has been proclaimed as protected, in order to obtain its support of the activities on the protection and conservation of biodiversity.

INTERNATIONAL COOPERATION (strategic area 9) has been achieved through numerous cross-border projects, or projects financed by individual donors from the international community, or projects supported by IPA funds. Some of the projects are the following:

- The "Dinaric Arc Parks" is primarily related to capacity building of managers of protected areas, where one of the goals is the formation of a network of protected area managers in the area of the Balkans. Within this project, a workshop "Adaptation to climate change" was held, as well as a workshop on the evaluation of benefits for the "Fruška Gora" National Park.
- The project Bioregio Carpathians "Integrated management of biological and landscape diversity for sustainable regional development management and ecological connectivity in the Carpathians". The goal of this project is to establish the balance between protection and sustainable development of the Carpathians through the definition and implementation of integrated management measures (the protection of large herbivores and carnivores in the Carpathian region, the elaboration of Red lists of animal species in the Carpathian region).
- The Ministry of Energy, Development and Environmental Protection has signed the Agreement on cooperation between signatory states in the preparation of serial nomination for the entrance of the Dinaric Karst into UNESCO's list, as well as in the management of this mutual, multilayer transnational karst area. In cooperation with the "Jovan Cvijić" Geographical Institute, the Institute for Nature Conservation singled out and prepared a preliminary – tentative list of the most significant protected areas within the Dinaric Karst, which included the following areas: the NP Tara, the NP Šargan-Mokra gora, the SNR Uvac and the SNR Klisura reke Trešnjice.

- The Initiative for coordinated elaboration and update of the Biodiversity Strategy has been initiated by Serbia in 2012 and supported by the ministries in charge of the conservation of nature and biodiversity of the West Balkan states, as well as by the UNDP and UNEP. The purpose of this initiative is that the regional countries should define, within their national Strategies, the goals and activities which are related to regional cooperation, in order for it to become institutionalized and empowered, to improve the exchange of experience and open new possibilities for work and implementation of activities regarding the protection of nature in the region.

Strategic area number 10, which is related to **CLIMATE CHANGE,** has been insufficiently realised.

- The Institute for Nature Conservation of Serbia participated in the work of the Subcommittee for the MAB and climate change, within the Committee for Science of the National Committee for Cooperation with UNESCO. Within the document "The first national report of the Republic of Serbia in accordance to the Framework UN Convention on climate change" (created in cooperation with the UNDP), evaluations of vulnerability of biodiversity, among other things, have been stated, as well as the proposal for adaptation measures. An evaluation of the realization of the proposed measures should be created during the process of preparation of the Second national report. Creation of the National strategy for adaptation to changed climate conditions and the Action plan within IPA 2 programming (2014-2016) has been proposed, and it should include biodiversity.
- The Ministry of Agriculture and Environmental Protection coordinates the project "The second national communication of the Republic of Serbia according to the Framework UN Convention on climate change", for which UNDP is the implementation agency.
- Within the project "Southeast European Forum for the Adaptation to Climate Change", which is financed through pre-accession funds of the European Union, the study "Evaluation of vulnerability to climate change – Serbia" was elaborated in 2012.

The IMPLEMENTATION OF THE STRATEGY, as the strategic area number 11, is monitored by the ministry in charge of environmental protection and the protection of nature. In 2014, a multi-sectoral work group has been formed to revise the current Biodiversity Strategy in accordance with the CBD Strategic Plan for Biodiversity 2011-2020. During the revision process, objectives and indicators for monitoring of the implementation of the Strategy will be identified.

3. PROGRESS TOWARDS 2015 AND 2020 AICHI TARGETS AND CONTRIBUTION TO RELEVANT 2015 MILLENNIUM DEVELOPMENT GOALS

3.1. Degree of harmonization of national objectives with Aichi Targets

In 2010, at the Conference held in Nagoya, Japan (COP 10, CBD), the signatory countries of the Convention on Biological Diversity adopted the Strategic plan for biodiversity for the 2011-2020 period, which represents a ten-year framework for activities that should be taken by all countries with the aim of conservation of biodiversity and services provided to man by nature. As a part of the Strategic plan, 20 targets have been adopted, also known as Aichi Targets, which represent guidelines for all member countries in creation of their own, national objectives.

Since most of the countries had created their Biodiversity strategies and action plans before the Convention, the recommendation is to perform a review of these documents in order to fulfil the obligations stated in the Strategic plan 2011-2020. Bearing in mind the fact that Serbia has enacted the Biodiversity Strategy for the 2011-2018 period immediately after the Conference of member states in Nagoya (2011), the national objectives for the conservation of biodiversity in the Strategy have not been fully aligned with the Aichi Targets. The Strategy review process was started in 2014, at the time of preparation of this report. At that time, analysis, connection and harmonization of the defined national strategic and individual goals with the Aichi Targets have not been performed. Based on the started evaluation of progress in the implementation of the Biodiversity Strategy of the Republic of Serbia (Section 2.7), the table shows the evaluation of progress in realization of national objectives and their correspondence to and connection with the Aichi Targets.

Table 25. National objectives

	Objectives
1.1.	Enable sustainability of endangered species and ecological communities in their natural habitats because of genetic diversity and the potential for evolutionary development. Renew biodiversity in degraded areas.
1.2.	Monitor, regulate and decrease the influence of processes and activities which have or will probably have significantly unfavourable impacts on biological diversity
2.1.	Establish and maintain an all-encompassing, adequate and representative protected areas system which includes the biological diversity of the Republic of Serbia
2.2.	Secure availability of financial assets for the maintenance and expansion of protected areas system in the Republic of Serbia, together with strengthening long-term financial sustainability of the system
3.1.	Develop new and strengthen existing mechanisms in order to secure sustainable utilization of biodiversity in the Republic of Serbia. Promote these mechanisms within the public and private sectors

3.2.	Ensure that social and economic benefits from the utilization of genetic resources and other products of biodiversity remain within the Republic of Serbia
3.3.	Increase national awareness and utilization of methods for economic evaluation of biodiversity for the purpose of a more precise evaluation and calculation of economic benefit from the protection of biodiversity in relation to activities which lead to the loss of biodiversity
4.1.	Strengthening and expansion of a political framework for the conservation of biodiversity
4.2.	Strengthen the legislative framework for the conservation of biodiversity and secure the implementation and harmonization of legislation which relates to biodiversity
4.3.	Strengthen the institutional framework for the conservation of biodiversity
4.4.	Strengthen and expand the financing of the conservation of biodiversity and provide incentives for the conservation of biodiversity within all sectors
5.1.	Create and implement integrated policies for theconservation and sustainable utilization of biodiversity at a national level
5.2.	Integration of biodiversity into all relevant sectors
6.1.	Collect, examine and unite available data and information on biodiversity in order to provide a basis for the assessment of the state, the monitoring, conservation and sustainable utilization of biodiversity
6.2.	Establish a national programme which will identify and monitor priority species, habitats and genetic components of biodiversity, as well as causes and consequences of activities and processes which endanger the components of biodiversity
6.3.	Provision of support to understanding and conservation of biodiversity in the Republic of Serbia
7.1.	Build and strengthen capacities within all competent public and private institutions for the conservation of biodiversity and sustainable utilization
7.2.	Develop necessary infrastructure and provide basic equipment for the monitoring of biodiversity, its conservation and sustainable utilization, within competent institutions
8.1.	Improve understanding of the importance of and develop the capacities for study and conservation of biodiversity through inclusion of information on biodiversity into teaching syllabuses and the curriculum
8.2.	Encourage the understanding of the public, the support and the activities for the conservation of biodiversity through provision of information
8.3.	Involve local population and communities into planning, decision-making and conservation of biodiversity
9.1.	Secure coherency and coordination between this strategy and other international obligations and agreements related to biodiversity
9.2.	Secure stable and efficient international cooperation for the protection of biodiversity

10.1.	Develop national strategies and mechanisms in order for the potential influence of climate change on biodiversity to be understood, planned and reduced to the lowest possible extent
10.2.	Increase the capacities of institutions responsible for the monitoring and prediction of influences of climate change on biodiversity and the evaluation of the efficiency of strategies and adaptation measures
10.3.	Increase the awareness of the influence exerted by climate change and adaptation strategies in all sectors and in the public
11.1.	Secure various sources and strategies for long-term financing of the Strategy. Secure that costs of conservation of biodiversity be allocated among institutions and interested parties, so that they reflect the contribution to the violation of biodiversity and the benefits from its protection and utilization
11.2.	Determine appropriate mechanisms and create the necessary capacities for the realization, monitoring and improvement of the Strategy

Table 26. National objectives in the process of harmonization with the Aichi Targets

National objectives	Aichi goals																			
	А1	А2	А3	А4	Б5	Б6	Б7	Б8	Б9	Б10	Ц11	Ц12	Ц13	Д14	Д15	Д16	Е17	Е18	Е19	Е20
1.1.												↗	→							
1.2.			→		→	→	↗	→	↗	→										
2.1.											↗									
2.2.											→									
3.1.														↗						
3.2.																→				
3.3.	↗↑														→					
4.1.																	↗	↗		→↘
4.2.																	→↗	→↗		→
4.3.																	→↗	→↗		→
4.4.																	→↗	→↗		→↘
5.1.				→																
5.2.		↗																		
6.1.																			→	
6.2.													→↗							


6.3.
7.1.
7.2.
8.1.
8.2.
8.3.
9.1.
9.2.
10.1.
10.2.
10.3.
11.1.
11.2.
Legend:
➔ registered initial pogress in achievment of the goal
↗ progress in achievement of the goal
↑ significant progress in achievement of the goal

The preliminary analysis of national objectives in the process of harmonization with the Aichi Targets suggests that stronger accent during the review of the Strategy should be put on the definition of goals which are related to the decrease of the loss of biodiversity through integration of biodiversity into activities performed by the government and the society (strategic goal A) as well as on the factors which lead to threats, and which have been defined in the Biodiversity Strategy and the Action plan within the Strategic goals 1, 3, 5, 6, 8, 9 and 10. Furthermore, goals which are not precisely established now and which relate to the Strategic goal B, i.e. the management and use of fish stocks, invertebrates and aquatic plants, should be defined separately. Ecosystem services should by all means be included in the redefined goals, in terms of provision of human health and well-being, in conformity with the Strategic goal D. Other goals match partially and mainly terminological harmonization needs to be performed.

3.2. Contribution to the implementation of the Convention on Biological Diversity and biodiversity objectives in realization of the relevant 2015 Millennium Development Goals

At the Millennium Summit, held in New York (USA) in September, 2000, Serbia, together with 189 countries, signed the Millennium Declaration which states the basic values on which international relationships in the 21st century should be based: freedom, equality, solidarity, tolerance, reverence for nature and division of responsibility. The promoted Millennium goals, which originated from the Declaration, include the fight against poverty, the provision of elementary education for everyone, the promotion of gender equality, the reduction of child mortality rates, the improvement of mothers' health, the fight against severe diseases, environmental protection, as well as the development of global partnership relationships for the purpose of development.

An overview of the realization of the Millennium Development Goals of the Government of the Republic of Serbia was adopted in 2005 and it represents a part of the Report on progress, which was created in all countries and which deals with the realization of the Millennium Development Goals for the period 2000-2005. The Millennium Development Goals have been adapted to specific needs and problems of citizens, at the level of state and local self-government, so in 2006, Serbia defined the National Millennium Development Goals until 2015 through the participative process of inclusion of a broader set of interested parties. The medium-term Report on progress was provided in 2009, after which, according to the assessment of the United Nations, the process of monitoring progress in the realization of goals has been neglected. In 2013, the UNDP created an assessment of Serbia's progress, in terms of the Millennium Development Goals indicators, for the 2006-2009-2012 period, based on available and relevant data (UNDP, 2013).

In 2012, Serbia was elected by the UN as one of 56 countries for the initiation of the national consultations about the sustainable development goals after 2015 ("Post-2015 National Consultations in Serbia).. This process establishes a new framework for developmental policies at a global level, which is based on achievements and learned lessons from the Millennium Development Goals, in order to impact the national policies in different sectors. Numerous development goals for the period after 2015 are closely related to the basic Millennium Development Goals.

Regarding the National Millennium Development Goals which have been defined for the 2006-2015 period, from the aspect of environmental protection, and particularly the protection of nature and biodiversity, MDG 7 stands out, as the goal through which it is necessary to **Secure sustainability of the environment** and Task 1: **Incorporate principles of sustainable development into national policies, stop the loss of natural resources and incite their revitalization,** with the following specific tasks:
1: until 2015 – adopt and implement national programs, strategies and laws which regulate the area of sustainable development and environmental protection in the Republic of Serbia;
2: until 2015 – increase the surface covered in forests to 32% of the total territory of the Republic of Serbia;
3: until 2010 – increase the surface of protected natural goods to 10% of the total territory of the Republic of Serbia;
4: until 2015 – decrease the number of households which use solid fuels to 25% of the total number of households in the Republic of Serbia;
5: increase energetic efficiency and utilization of renewable sources of energy;
6: decrease air pollution.

Based on the analysis performed by the UNDP in 2013, it has been established that task 1 has been fulfilled since the percentage of forested land has increased, the number of households which use solid fuel has reduced almost to a half, and an increase and then a decrease of the carbon dioxide emission has also been registered. Also, the National strategy for sustainable development has been enacted (2008), and a large number of municipalities in Serbia has created Local strategies for sustainable development. The issues which relate to the environment have had a significant presence in the media and a significant progress has been made regarding the increase of awareness of the population of the need to protect the environment.

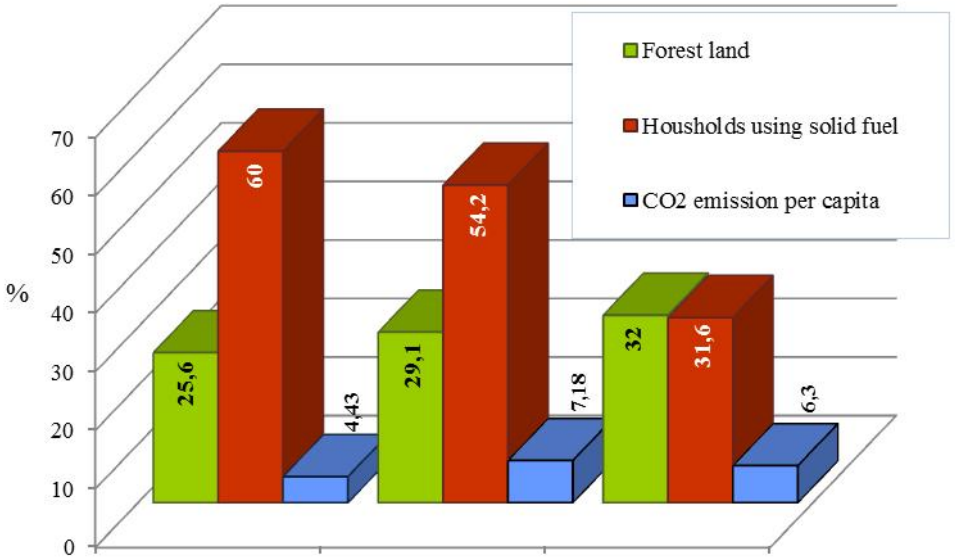


Figure 17. The surface of land covered with forests in relation to the territory of the Republic of Serbia, the number of households which use solid fuel in relation to the total number of households and carbon dioxide emission (tons CO_2) per inhabitant for 2000, 2006 and 2012 (displayed in %)

Regarding the indicators which relate to the protection of nature, the measures that have been taken for the realization of the activities defined in the Biodiversity Strategy of the Republic of Serbia and the action plan for the 2011-2018 period have enabled the fulfilment of specific tasks 1 and 2, whereas task 3 has been only partially fulfilled, in the sense that the percentage of surface under protection in Serbia has increased, but 10%, as the percentage envisaged in the Spatial plan of the Republic of Serbia, has not been protected.

The "Serbia we want" Initiative – development priorities after 2015

In 2013, the "Serbia we want" Initiative was a part of the most encompassing global consultative process of the United Nations, which was realized under the slogan "TheWorld we want 2015". The goal of open consultations, especially with the civil society, was to recognize the problems which exist around the world and propose manners for their resolution, and create strategic coalitions and partnerships which can aid the formation of the development agenda after 2015.

The new agenda was added to the progress achieved through the Millennium Development Goals of the UN, but its goal was also to respond to numerous challenges, which have become more important after the adoption of MDGs, and which have not been adequately encompassed in this framework. From the aspect of environmental protection, those were combating climate change, sustainable development and increased resistance to natural disasters.

The whole action included opinions of a large number of citizens, the private, public and civil sectors, the politicians, the media, various organizations and institutions. Based on the obtained information, citizens of Serbia have chosen conservation of the environment as one of the nine priorities. "The state of the environment in Serbia is not at a satisfactory level. This equally relates to the state of waters and aquatic resources, air, biodiversity, forests and soil. General findings of the consultations state that the issues of environmental protection are mostly in the focus of the youth, population from rural areas, experts and certain non-governmental organizations. Among the main problems identified by these groups are the following: energy poverty, negligence regarding development of alternative and available energy sources, removal of industrial waste, locations for waste disposal and disposal of solid waste, air, water and soil pollution, as well as a low level of awareness regarding the protection of the environment (http://www.srbijakakvuzelim.rs).

The proposals for new global development goals for the period after 2015 have been finished and will be considered at a special meeting during the General Assembly of the UN, in September, 2015.

ANNEX 1 – Information on the process of preparation of the Fifth National Report

The Fifth National Report of the Republic of Serbia to the United Nations Convention on Biological Diversity was prepared pursuant to Article 26 of the Convention on Biological Diversity and Decision X/10 COP which relate to National reporting: overview of experiences and proposals for the Fifth National Report (UNEP/CBD/COP/DEC/X/10, October 29, 2010). Elaboration of the Fifth National Report is a part of the project National Biodiversity Planning to Support the implementation of the CBD 2011-2020 Strategic Plan in the Republic of Serbia'', which started in 2013 and is implemented by the UNDP and the Ministry of Agriculture and Environmental Protection. The project is financed by theGlobal Environment Fund, as a part of the second generation of Biodiversity Enabling Activities (BDEA). The project addresses the country's need to continue to fulfill its obligations under the CBD, with particular focus on the Convention's Article 6 and the CBD COP Decision X/2. Above all, the project is a significant contribution to Serbia's efforts towards implementing the CBD Strategic Plan 2011-2020 at the national level. It aims to integrate Serbia's obligations under the CBD into its national development and sectoral planning frameworks through a renewed and participative 'biodiversity planning' and strategizing process. The process of preparation of the Fifth National Report started with consultations between UNDP, as the implementation agency, and the ministry which was authorized for nature conservation in the autumn of 2013. The Institute for Nature Conservation was elected for coordination of the process of collection of data and information from relevant stakeholders.

The activities for preparation of the Report included:

- Introduction to the guidelines for writing the Report and the preparation of work plan,
- Engagement of coordinator for collection and compilation of data,
- Organization of two consultative meetings with relevant stakeholders,
- Individual interviews with the aim of obtaining information,
- E-mail correspondence with representatives from selected institutions,
- Meetings with researches and representatives of institutions/organizations,
- Preliminary analysis of the Questionnaire on evaluation of progress in implementation of the Biodiversity Strategy of the Republic of Serbia and the Action Plan for the period from 2011-2018,
- Elaboration of the first draft and consultations with UNDP, the Ministry of Agriculture and Environmental Protection,
- Public presentation of the first draft to the stakeholders, electronic distribution of the first draft and collection of comments, corrections and suggestions,
- Integration of received comments, corrections and suggestions into the Second Draft,
- Communication and comments of the second draft,
- Elaboration of the final version of the Report,
- Adoption of report by the Ministry of Agriculture and Environmental Protection.

The Questionnaire on evaluation of progress in implementation of the Biodiversity Strategy of the Republic of Serbia for the period from 2011-2018 was filled in and submitted by 26 state, scientific and expert institutions, managers of protected areas and non-governmental organizations. The information from the Questionnaire was used as the starting basis for further development of communication with interested parties, which possessed relevant data for the Fifth National Report.

Consultative meetings were organized in such manner that the first meeting, which was attended by about 50 participants, served for introduction of interested parties to the process, guidelines,

methodology and manner of communication within collection of data and information. At the second meeting, which was attended by about thirty participants, the Second Draft of the report was presented and comments, corrections and suggestions were collected, in order to improve the document and present the real state of biodiversity in Serbia.

In the process of elaboration of the Fifth National Report on implementation of the Convention on Biological Diversity, the following institutions have given their contribution by delivering information and data:

- The Ministry of Agriculture and Environmental Protection: Department for Nature Conservation, Plant gene bank of the Directorate for National Referent Laboratories, Department for Organic Agriculture, Water Directorate, Veterinary Administration, Forest Administration,
- The Ministry of Construction, Traffic and Infrastructure: Department for Spatial Planning,
- The Ministry of Education, Science and Technological Development: Department for Quality Security of Scientific-Research Work and Development of Scientific-Research Activity,
- Ministry of Economy: Tourism Sector,
- Serbian Environmental Protection Agency,
- Spatial Planning Agency: Department of Education and Provision of Expert Help in Elaboration of Spatial Plans,
- Republic Geodetic Authority,
- Institute for Nature Conservation of Serbia,
- Provincial Secretariat for Urban Planning, Construction and Environmental Protection of the Autonomous Province of Vojvodina,
- Institute for Nature Conservation of Vojvodina Province,
- Natural History Museum,
- Faculty of Biology – University of Belgrade,
- Faculty of Geography - University of Belgrade,
- Faculty of Forestry - University of Belgrade,
- Faculty of Agriculture - University of Belgrade,
- Faculty of Mathematics and Natural Sciences – University of Kragujevac: Institute for Biology and ecology,
- Faculty of Mathematics and Natural Sciences – University of Nis: Department of Biology and Ecology,
- Faculty of Applied Ecology “Futura“,Belgrade,
- Institute for Multidisciplinary Research, Belgrade,
- Institute for Biological Research ’’Sinisa Stankovic“, Belgrade,
- Limited liability company ’’Uvac Reserve“,
- The Gorani Movement from Sremska Mitrovica: manager of Special Nature Reserve ’’Zasavica’’,
- Center for Natural Resources ’’Natura“,
- Public enterprise National park Kopaonik,
- Public enterprise National park Tara,
- Public enterprise National park Djerdap,
- Public enterprise National park Kopaonik,
- Public enterprise National park „Fruška Gora“,
- Public enterprise „Srbijašume“,

- Public enterprise „Vojvodinašume“,
- Public enterprise „Srbija vode“,
- ZOO Palic,
- Tourism organization of Cacak,
- Young Researches of Serbia,
- Association ’’Protego’’,
- IUCN Office for Southeast Europe,
- WWF Danube-Carpathian Programme,
- Serbian Ecosystem Services Partnership (SESP).

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http://webrzs.stat.gov.rs/WebSite/

Appendix I - Information concerning reporting Party and preparation of national report

A. Reporting Party

Contracting Party	Republic of Serbia
NATIONAL FOCAL POINT	
Full name of the institution	Ministry of Agriculture and Environmental Protection
Name and title of contact officer	Jelena Ducic, advisor, CBD Primary FP
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CONTACT OFFICER FOR NATIONAL REPORT (IF DIFFERENT FROM ABOVE)	
Full name of the institution	
Name and title of contact officer	
Mailing address	
Telephone	
Fax	
E-mail	
SUBMISSION	
Signature of officer responsible for submitting national report	Jelena Ducic, advisor, CBD Primary FP
Date of submission	August 15, 2014