NATURE AND BIODIVERSITY

MK – NI 007

THREATENED AND PROTECTED SPECIES

Period of indicator assessment

- September 2007 – April 2008

Explanation

- Justification for indicator selection

There are a number of ways of assessing progress towards the target of halting the loss of biodiversity in Europe by 2010. This indicator tracks changes in the status of species at national level that are threatened at the global level and can thus contribute to assessing progress towards the target by acting as a proxy indicator for the impacts of national policies on European biological diversity.

For many years, the International Union for Conservation of Nature (IUCN) has monitored the extent and rate of biological diversity degradation by assigning species to red list categories through detailed assessment of information against a set of objective, standard, quantitative criteria. This assessment is made at the global level. For species present in European territories and only, and evaluated as globally threatened, this indicator shows the impacts of European and national policies on European biodiversity.

For globally threatened species present in and also outside Europe, some of the species may not be classified as threatened at European or national levels. Nevertheless, Europe has a strong responsibility for the care of these species even though they are not yet threatened. How far European policies on nature and biodiversity take this responsibility into consideration is shown by the information that the indicator provides on the number of globally threatened species that are protected at the European level.

Definition

This indicator shows the number of species present in the Republic of Macedonia and assessed as globally threatened and/or protected by European instruments (such as EU Directives and the Bern Convention) protected at national level.

At present, the indicator shows the status of the number of endemic and threatened species at national level, identified in accordance with the relevant international documents and with the national legislation:

- Number of endemic and threatened wild species of plants
- Number of endemic and threatened wild species of fungi
- Number of endemic and threatened wild species of vertebrate animals

Units

- Number of spieces

Policy relevance of the indicator

List of relevant policy documents:

The Second National Environmental Action Plan, in its Chapter on Nature, emphasizes the goal of the establishment of integrated system for nature and biological diversity protection, in line with the EU standards and multilateral agreements, through the measure for application of mechanisms for further implementation of the National Strategy for Biological Diversity Protection with Action Plan and the National Capacity Self-Assessment (NCSA), the Law on Nature Protection and creation of appropriate conditions for Natura 2000 network establishment. It envisages action towards development of National Red Lists and Red Book.

The National Strategy for Biological Diversity Protection with Action Plan defines integrated approach to the protection and sustainable use of components of biological diversity. The Action Plan outlines the specific actions to be taken to achieve the goals. One of the measures is the document Protection of Species, through several actions concerning elaboration of National Red Lists and Red Book, vultures protection, protection of endemic and relict species *Thymus oehmianus*, etc.

Legal grounds

The Law on Nature Protection provides for elaboration of Red Lists and Red Book, as well as proclamation of strictly protected wild species and protected wild species, by which they shall acquire the status of natural heritage.

Targets

Identification of the extent of threat for certain species of plants, fungi and animals found in the Republic of Macedonia, which are of European or global significance and definition of measures for their protection and management.

Key policy issue

How many species of European/global significance are protected by national instruments?

Key message

Abundance and variety of species and ecosystems are the main features of biological diversity in the Republic of Macedonia. According to the available information, this wealth comprises the imposing number of around 18.000 taxa, out of which more than 900 taxa are Macedonian endemic taxa.
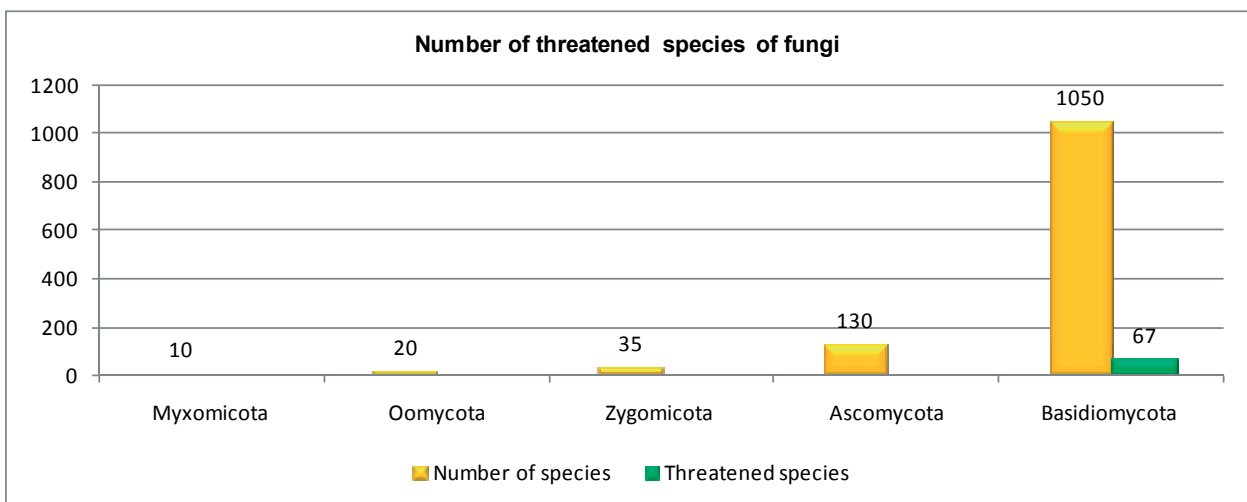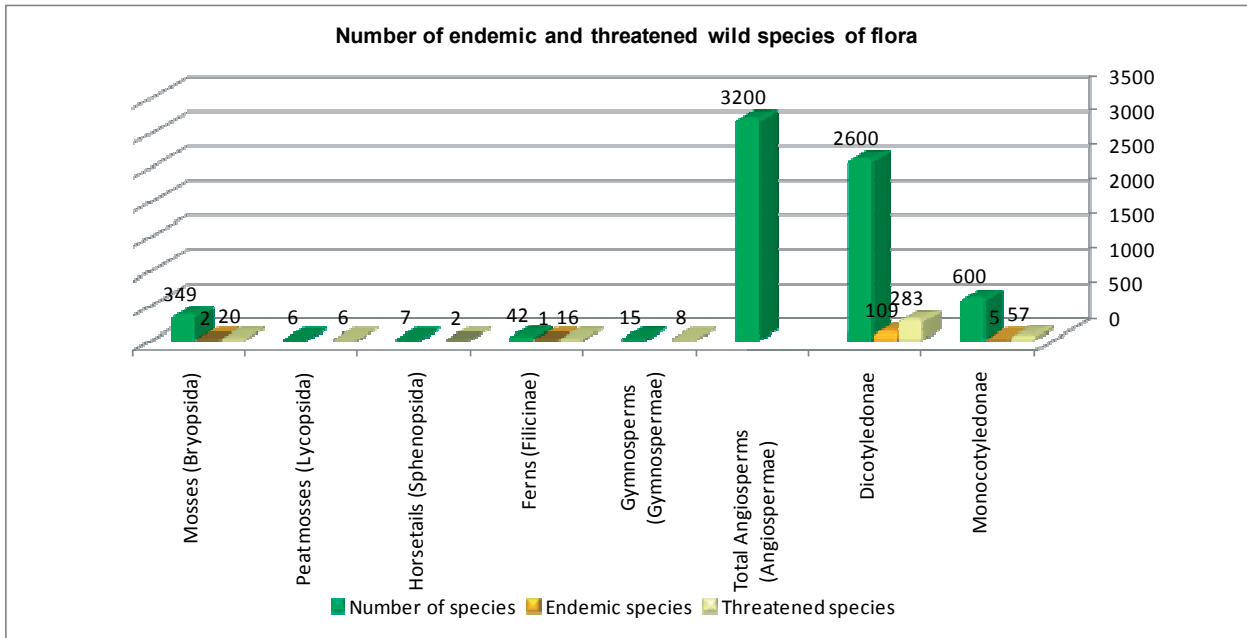
Considering the fact that national Red Lists of plants, fungi and animals have not been established yet, the analysis of affected / threatened species has been made in accordance with international criteria contained in a number of multilateral documents (conventions, agreements, Global Red List, European Red List, EU Directives), etc.
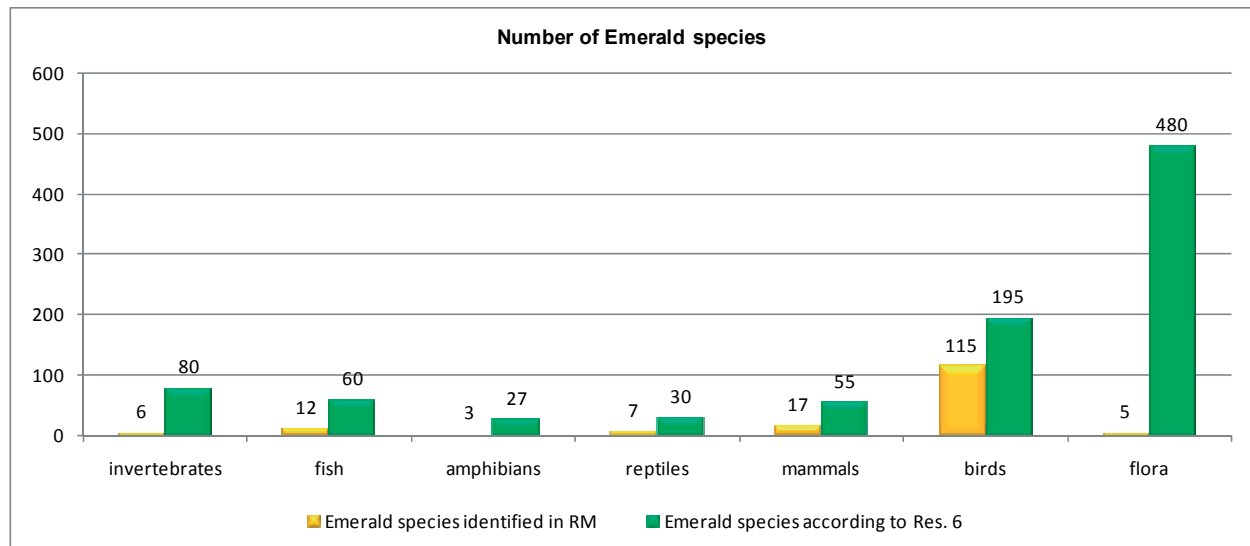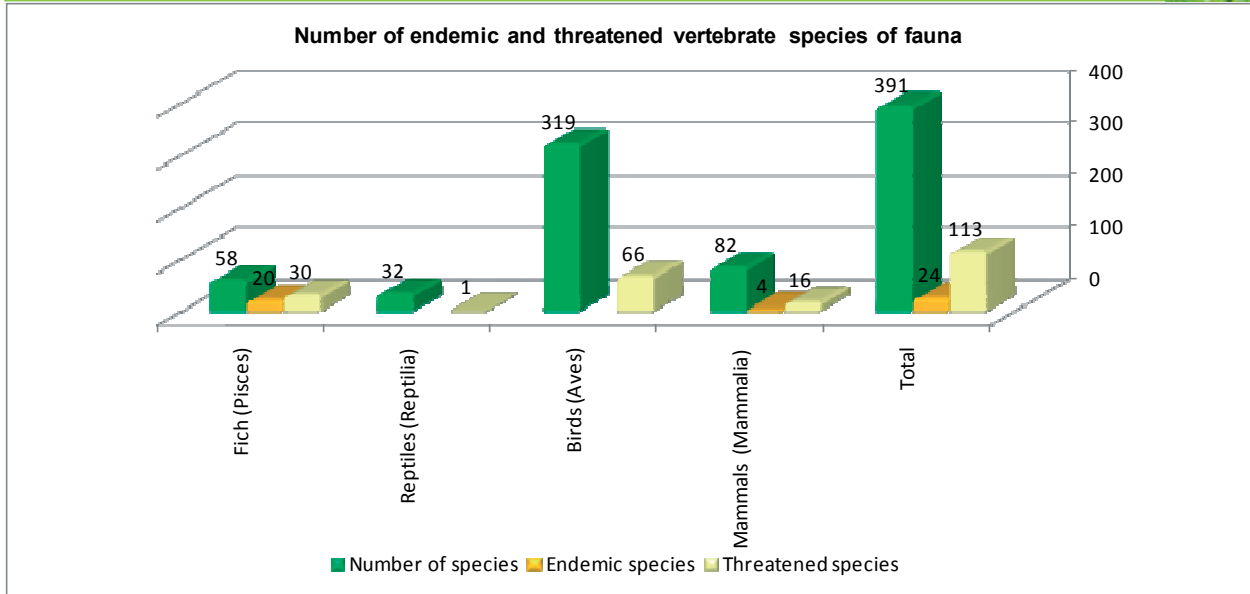
Thus, the IUCN World Red List contains 72 taxa of higher plants from the Republic of Macedonia, 19 of which are local endemic taxa. The Annexes of the Bern Convention include 12 species of higher plants.

The European List of vertebrate animals includes 113 species, of which: 30 fish species, 66 bird species16 mammals and 1 reptile species. Out of the total of 20 endemic fish species from the Republic of Macedonia, 17 have been enrolled in the category of globally threatened species. The total number of identified "Emerald" species (under Resolution No.6 to the Bern Convention) on the territory of the Republic of Macedonia is 165 species.

Number of endemic and threatened wild species of flora

Number of threatened species of fungi

ENVIRONMENTAL INDICATORS OF THE REPUBLIC OF MACEDONIA

Number of endemic and threatened vertebrate species of fauna

Legend: ■ Number of species ■ Endemic species ■ Threatened species

Number of Emerald species

Legend: ■ Emerald species identified in RM ■ Emerald species according to Res. 6

Assessment

The flora of higher plants in the Republic of Macedonia is very rich and diverse, represented by around 3700 species. Recent flora of higher plants is represented by a mosaic of various plant elements (Tertiary relict, Mediterranean, Greek-Asia Minor, Illyric, Caucasian, Middle European, Eurasian, Arctic-Alpine, cosmopolitan); there is high number of endemic species among higher plants, too (Balkan, South Balkan, Macedonian, etc.). The highest number of endemic plant species (114) has been recorded with *Angiosperms*.

The National Red List of threatened wild flora species has not been developed yet. The affected species shown in the Table have been included in accordance with international criteria contained in several international documents (conventions, agreements, Global Red List, European Red List, EU Directives). The IUCN Global Red List contains 72 taxa from the Republic of Macedonia, 19 of which are local endemic taxa. The Annexes of the Bern Convention list 12 species having their area of spreading on the territory of the Republic of Macedonia.

Fungi compose exceptionally heterogeneous group of organisms; however, studies so far have focused on the orders of *Ascomycota* and *Basidiomycota*, while other orders are poorly studies. Out of the total number of recorded growing wild fungi on the territory of the Republic of Macedonia (around 1250 species), most belong to the orders *Myxomicota* (10), *Oomycota* (20), *Zygomicota* (35), *Ascomycota* (130) and *Basidiomycota* (1050).

The Preliminary National Red List of threatened fungi species includes 67 species belonging to the order of *Basidiomycota*.

The main feature of the fauna is its high extent of taxonomic diversity, represented by as many as 9339 species and 228 subspecies or 9567 taxa in total.

Among vertebrate fauna, the highest endemism has been tracked with fish class the share amounting 34.5%, while from among other four classes, four endemic taxa have been recorded with mammals only. Out of the total of 20 endemic fish species, 17 have been included in the category of globally threatened species.

From among vertebrate animals, 113 recorded species have been enrolled on the European Red List, namely: 30 species of fish, 66 birds, 16 mammals and 1 reptile species. The National Red List of threatened fauna species has not been completed yet.

Within the species diversity, particular significance is attributed to the identified "Emerald" species. Namely, total of 165 species have been identified, as follows: 6 species of invertebrate animals, 12 species of fish, 3 species of amphibians, 7 species of reptiles, 115 species of birds, 17 species of mammals and 5 species of plants.

Data specification

Title of the indicator	Source	Reporting obligation
Threatened and protected species	− Study on the Status of Biological Diversity in the Republic of Macedonia − Strategy and Action Plan for Bilogical Diversity Protection in the Republic of Macedonia	

Data coverage (by years):

Table 1: Number of endemic and threatened wild species of flora

	Number of species	Endemic species	Threatened species
Mosses (*Bryopsida*)	349	2	20
Peat mosses (*Lycopsida*)	6		6
Horsetails (*Sphenopsida*)	7		2
Ferns (*Filicinae*)	42	1	16
Gymnosperms (*Gymnospermae*)	15		8
Total Angiosperms (Angiospermae)	3200		
Dicotyledonae	2600	109	283
Monocotyledonae	600	5	57
Total	3700	117	392

Table 2: Number of threatened fungi species

	Total number of species	Threatened species
Myxomicota	10	
Oomycota	20	
Zygomicota	35	
Ascomycota	130	
Basidiomycota	1050	67
Total	1245	67

Table 3: Number of endemic and threatened vertebrate fauna species

	Total number of species	Endemic species	Threatened species
Fish (*Pisces*)	58	20	30
Reptiles (*Reptilia*)	32		1
Birds (*Aves*)	319		66
Mammals (*Mammalia*)	82	4	16
Total	391	24	113

Table 4: Number of Emerald species identified in the Republic of Macedonia

	invertebrates	fish	amphibians	reptiles	mammals	birds	flora
Emeralds pecies identified in the Republic of Macedonia	6	12	3	7	17	115	5
Emerald species according to Res. 6	80	60	27	30	55	195	480

General metadata

Code	Title of the indicator	Compliance with CSI/ EEA or other indicators		Classification by **DPSIR**	Type	Linkage with area	Frequency of publication
MK NI 007	**Threatened and protected species**	CSI 007	Threatened and protected species	**S/I**		Biological diversity	5 - annually

Geographical coverage: Republic of Macedonia

Temporal coverage: 2003 - 2004

Future activities

- **Short-term activities**

a. Description of the activity

– Development of national Red Lists of plants, fungi and animals.

– Definition of national indicator of threatened and protected species.

b. Required resources

– Establishment of work group to establish the national indicator of threatened and protected species.

c. Status

– Activities are underway.

   Deadline: 2008

- **Long-term activities**

– Development of national Red Books of plants, fungi and animals.

– Elaboration of monitoring programme for species to be identified as threatened.

MK – NI 008

DESIGNATED AREAS

Period of indicator assessment

■ September 2007 – April 2008

Explanation

■ Justification for indicator selection

Measures to conserve or restore biodiversity are taken at different geographical and policy levels (international, European and national). These measures may have different criteria and objectives but should be complementary. Thus the indicator concentrates on the trends of designated areas according to different policy instruments (ratified multilateral agreements, EC Birds and Habitats Directives and national instruments) and how effective they are in reaching objectives (sufficiency index).

The Sufficiency Index answers to the specific policy question "Are these measures effective in reaching the objectives?" by telling us if species and habitats listed by the EU Birds and Habitats Directives, and Bern Convention, are sufficiently represented in the protected areas.

Definition

The indicator shows the proportion of a country designated total area that is protected under national instruments, or under the EU Birds and/or Habitats Directives (Natura 2000 sites), or under the Bern Convention (Emerald sites) and other multilateral agreements.

– Total (cumulative) designated area of sites protected under national instruments, or under the EU Birds and/or Habitats Directives and under multilateral agreements over the time.

The indicator is also broken down to show the different trends of surface area in km2 designated under international conventions and initiatives, under EU Directives and under national legislation:

– Number of protected areas under the national categorization

– Percentile representation of individual national categories of protected areas out of the total protected area

– Changes over time in the number of areas designated under the national legislation

– Changes over time in cumulative surface area of nationally protected sites

– Changes over time in cumulative surface area of Emerald sites (designated under the Bern Convention).

Units

– Number of sites, km^2 and %.

Policy relevance of the indicator

List of relevant policy documents

The Spatial Plan of the Republic of Macedonia for the period 2002 - 2020 envisages extension of the total area of protected areas from the current 7.34% to 11.6 % of the national territory in future.

The Second National Environmental Action Plan, in its Chapter on Nature, emphasizes the goal of the establishment of integrated system for nature and biological diversity protection, in line with the EU standards and multilateral agreements, through the measure for application of mechanisms for further implementation of the National Strategy for Biological Diversity Protection with Action Plan and the National Capacity Self-Assessment (NCSA), the Law on Nature Protection and creation of appropriate conditions for Natura 2000 network establishment.

The National Strategy for Biological Diversity Protection with Action Plan, adopted by the Government in 2004, defines integrated approach to the protection and sustainable use of components of biological diversity. The Action Plan outlines the specific actions to be taken to achieve the goals. One of the measures is the expansion of the system of designated areas, as well as elaboration of proposals for nomination of new designated sites, as well as proposals for nomination of new areas for the Global Ramsar List and the List of the World Heritage under the UNESCO.

Legal grounds

The Law on Nature Protection provides for introduction of a system of designated areas aimed at protecting biological diversity in natural environments, natural processes, as well as abiotic characteristics and biological diversity of the area. Protection of nature is carried out through protection of biological and landscape diversity and protection of natural heritage within and outside designated areas.

Targets

Expansion of the network of national designated areas up to around 12% under the Spatial Plan and National Strategy for Biological Diversity Protection, and by areas designated under international conventions and initiatives.

Identification of all areas in the National Emerald network and Natura 2000.

Key policy issue

What is the progress in designation of areas (km^2, %) under the national legislation, EU Directives and multilateral agreements?

Key message

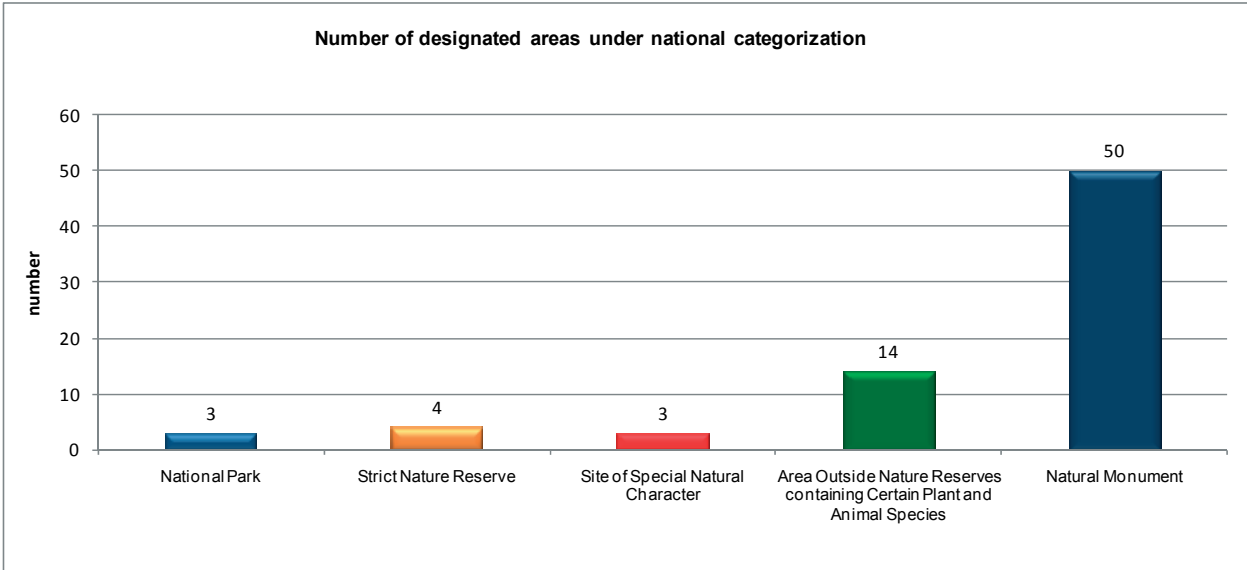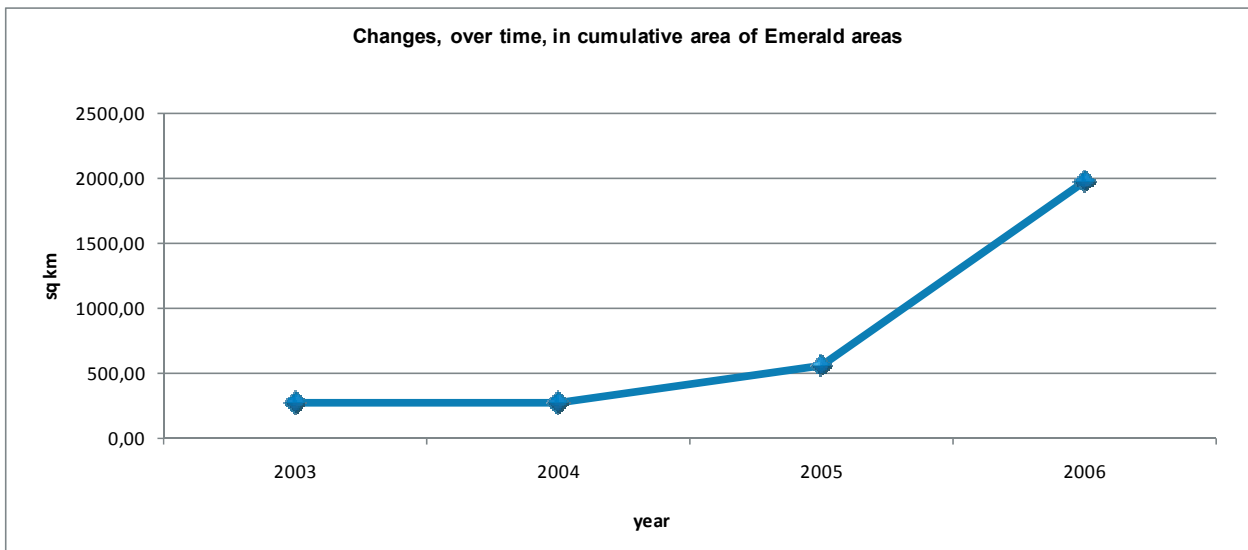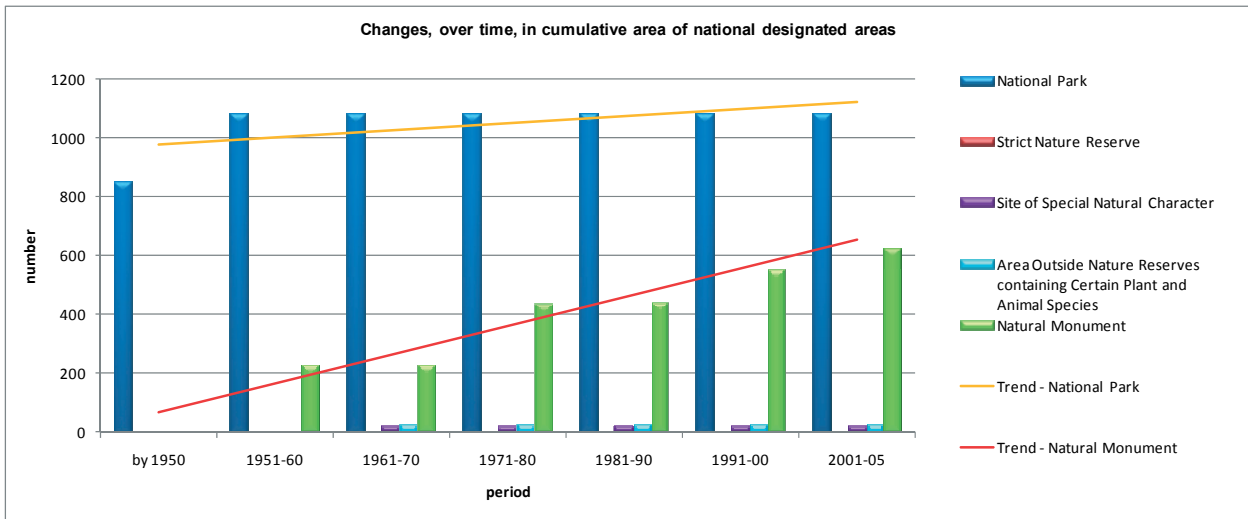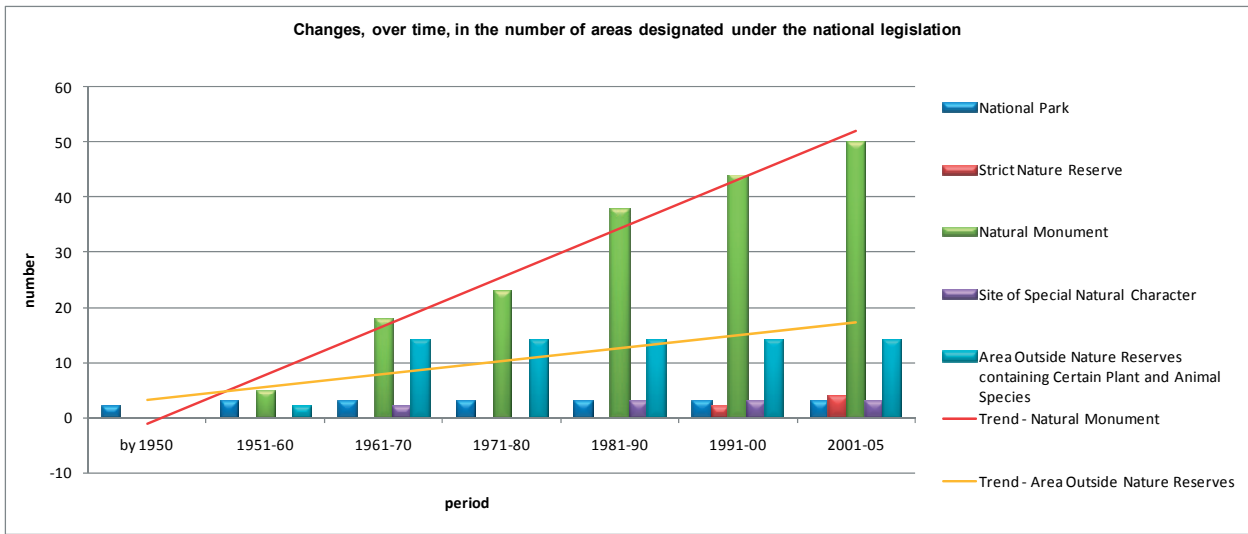As of 1948, when the First National Park "Pelister" was designated in the country, the number and the total surface area of different categories of protected areas have noted permanent growth on national level. Most of those areas are National Parks (58 %) and Monuments of Nature (33 %).

Under the new Law on Nature Protection, new categorization of designated areas has been adopted in accordance with the model of the International Union for Conservation of Nature (IUCN) (six categories of designated areas).

The National Emerald network of areas of special conservation interest, initiated in 2002, comprises 16 areas which cover a total area of 198.145 ha, or around 7.7% of the total national territory. Activities towards identification of new Emerald areas will continue until its full establishment. Emerald areas will be included in the Natura 2000 network when the Republic of Macedonia becomes a EU Member State.

Number of designated areas under national categorization

Share of individual national categories of designated areas in the total surface area under protection, in percentage

Changes, over time, in the number of areas designated under the national legislation

Legend:
- National Park
- Strict Nature Reserve
- Natural Monument
- Site of Special Natural Character
- Area Outside Nature Reserves containing Certain Plant and Animal Species
- Trend - Natural Monument
- Trend - Area Outside Nature Reserves

Changes, over time, in cumulative area of national designated areas

Legend:
- National Park
- Strict Nature Reserve
- Site of Special Natural Character
- Area Outside Nature Reserves containing Certain Plant and Animal Species
- Natural Monument
- Trend - National Park
- Trend - Natural Monument

Changes, over time, in cumulative area of Emerald areas

ENVIRONMENTAL INDICATORS OF THE REPUBLIC OF MACEDONIA

Changes, over time, in the number of Emerald areas

Assessment

Since 1948, when the first National Park was designated, there has been constant rise in the total area of different national categories of protected areas. Today, the network of designated areas in the Republic of Macedonia comprises 74 Items of Nature, occupying a total surface area of 188.734 hectares or 7.34% of the national territory. The structure is arranged under the old categorization, as follows: Strictly Protected Natural Reserve (SNR), National Park (NP), Monument of Nature (MN), Site of Special Natural Characteristics (ASNC) and area outside natural reserves containing certain plant and animal species (CPAS). Most of the currently designated protected areas are National Parks (58%) and Monuments of Nature (33%).

Under the new Law on Nature Protection, new categorization is in course of introduction, upon its alignment with the IUCN method: Strictly Protected Natural Reserve, National Park, Monument of Nature, Nature Park, Protected Landscape and Multi-purpose Area. The Law allows for a transitional period of six years from its entry into force, when the revalorization of protected areas designated prior to its adoption will be completed.

According to the Spatial Plan of the Republic of Macedonia, for the period 2002-2020, expansion of the total surface `area of designated areas has been envisaged, to rise from the current 7.34% to 11.6 % of the national territory. For the sake of comparison, the percentage of designated areas in most of the European countries ranges between 10 and 15 % of the total national territory.

Designated areas with internationally recognized status include:

- Monument of Nature "Ohrid Lake" – World Natural Heritage (UNESCO);
- Monument of Nature "Prespa Lake" – Ramsar Site;
- Monument of Nature "Markovi Kuli" (*King Mrko's Towers*) - World Natural Heritage (UNESCO's Tentative List); and
- Monument of Nature "Slatinski izvor" (*The Springs of Slatino*) - World Natural Heritage (UNESCO's Tentative List).

In 2002, the Republic of Macedonia commenced the process of establishment of the Emerald network of areas of special conservation interest (ASCI), established on the territories of the countries Parties to the Bern Convention and important part in the preparation of candidate countries for EU membership.

By means of the implementation of a pilot-project (2002 - 2003), 3 ASCIs were identified and proposed, accounting for around 10% of the total National Emerald Network. Activities aimed at establishing the Emerald network have continued in the following years, to result in 16 areas proposed for inclusion in the National Emerald Network so far. This corresponds with around 80% of the total Emerald Network of the Republic of Macedonia. The total surface area of the so far proposed areas is 198.145 ha, where the smallest area occupies a surface area of 810 ha (The Springs of Smolare), and the largest one is Mariovo with a surface area of 73.088 ha. Part of the proposed areas have already been protected at national level under different categories, as follows: NP Galicica, SNR Ezerani, MN Dojran Lake, NP Pelister, SNR Tikves, MN Demir Kapija, NP Mavrovo, MN Matka, MN Smolarski Vodopad and MN Markovi Kuli.

The Emerald network is an efficient tool in the preparation for the implementation of Birds and Habitat Directives, for the countries moving towards EU membership.

Methodology

■ Methodology for the indicator calculation

The procedure for identification and designation of different categories of protected areas derives from the Law on Nature Protection, EU Directives and provisions of multilateral agreements.

Data specification

Title of the indicator	Source	Reporting obligation
Designated areas	CDDA Emrald database	– Annually, to the European Environmental Agency – Annually, to the Secretariat of the Bern Convention with the Council of Europe

Data coverage (by years):

Table 1: Number of designated areas under the national categorization

Category	DESIGNATED AREA	Number	Total Area in sq km
A	National Park	3	1083.38
A	Strict Nature Reserve	4	128.55
A	Site of Special Natural Character	3	23.38
A	Area Outside Nature Reserves containing Certain Plant and Animal Species	14	26.45
A	Monument of Nature	50	625.58
	Total	**74**	**1887.34**

Table 2: Share of individual national categories in the total area under protection, in percentage

Designated area	Number	Total Area in sq km	%
National Park	3	1083,38	58%
Strict Nature Reserve	4	128,55	7%
Site of Special Natural Character	3	23,38	1%
Area Outside Nature Reserves containing Certain Plant and Animal Species	14	26,45	1%
Monument of Nature	50	625,58	33%
Total	**74**	**1887,34**	**100%**

Table 3: Changes, over time, in the number of areas protected under the national legislation

Designated area	by 1950	1951-60	1961-70	1971-80	1981- 90	1991-00	2001-05
National Park	2	3	3	3	3	3	3
Strict Nature Reserve	0	0	0	0	0	2	4
Natural monument	0	5	18	23	38	44	50
Site of Special Natural Character	0	0	2	0	3	3	3
Area Outside Nature Reserve containing Certain Plant and Animal Species	0	2	14	14	14	14	14

Table 4: Changes, over time, in the cumulative surface area of national designated areas

Designated area	by 1950	1951-60	1961-70	1971-80	1981-90	1991-00	2001-05
National Park	855.88	1083.38	1083.38	1083.38	1083.38	1083.38	1083.38
Strict Nature Reserve	0	0	0	0	0	127.3	128.55
Site of Special Natural Character	0	0	22.53	22.53	23.38	23.38	23.38
Area Outside Nature Reserves containing Certain Plant and Animal Species	0	0.06	26.45	26.45	26.45	26.45	26.45
Monument of Nature	0	232.67	232.85	439.58	444.17	554.28	625.58

Table 5: Changes, over time, in the number and area of Emerald sites

	2003	**2004**	**2005**	**2006**
Number	3	3	6	16
Total area in sq km	275,83	275,83	559,38	1981,45

General metadata

Code	Title of the indicator	Compliance with CSI/ EEA or other indicators		Classification by **DPSIR**	Type	Linkage with area	Frequency of publication
MK NI 008	**Designated areas**	CSI 008	Designated areas	**R**	A	Biological diversity nature policies	Annually

Geographical coverage: Republic of Macedonia

Temporal coverage: 1948 - 2006

Frequency of data collection: annual

Information on the quality (at data level): The process of revalorization of the currently protected areas and their re-designation in line with the new categorization, new, accurate data/information on designated areas will be collected.

Note: The CDDA database contains data under the old categorization.

Future activities

■   Short-term activities

a.   **Description of the activity**

−   Definition of national set of indicators for designated areas.

b.   **Required resources**

−   Establishment of Working Group to elaborate the national set of indicators for designated areas.

c.   **Status**

−   Activities are underway

Deadline: 2008

■   Long-term activities

Redesignation of the currently protected areas by accurate definition of boundaries and surface area and production of digital boundaries.

Valorization and designation of new areas to be protected under the new categorization. Identification of new areas to be included in the National Emerald Network.

ENVIRONMENTAL INDICATORS OF THE REPUBLIC OF MACEDONIA

MK – NI 009
SPECIES DIVERSITY

Period of indicator assessment

- September 2007 – April 2008

Explanation

- Justification for indicator selection

The objective of this indicator is to produce a generic indicator that will show the state and trends of biological diversity in Macedonia. At present the trend information for species at national level is very limited, so for the purpose of this indicator it is split into trend assessments for different species groups. It is possible to develop a methodology for trends establishment for more species and species groups, but for now there are initial activities only for birds.

The trends for all species are linked to different habitat types. An assessment of the trend for a group of species linked to a particular habitat type, can give a good indication of the quality of that habitat type.

Selection of the species and species groups is based primarily on the availability of data and the need to show trends for various species groups. Future development of the indicator will involve extending the concept to include other species and species groups, while also defining common criteria for inclusion or deletion of species.

Definition

The indicator will show the trend in the number and distribution of selected species or species groups at national level, as relative assessment compared to the baseline of the monitoring commencement.

At the moment, species groups considered are the birds.

The indicator will show the trend of common birds species (developing) and the trend of certain selected species of birds of pray.

Units

- Number of species, estimated number of individuals for certain species.

Policy relevance of the indicator

List of relevant policy documents

The Second National Environmental Action Plan, in its Chapter on Nature, emphasizes the goal of the establishment of integrated system for nature and biological diversity protection, in line with the EU standards and multilateral agreements. One of the

actions envisaged for the goal achievement is development of national monitoring programme for biological diversity components and elaboration of national biodiversity indicators.

The National Strategy for Biological Diversity Protection with Action Plan defines integrated approach to the protection and sustainable use of components of biological diversity. The Action Plan outlines the specific actions to be taken to achieve the goals. The strategic commitment "Research and monitoring" includes action for national biodiversity indicators development.

Legal grounds

The Law on Nature Protection provides for monitoring of the state of the nature. The monitoring methodology needs to be specified in a regulation. The monitoring over the state of nature is carried out through: measurement, observation, assessment and control of the state of species, their habitats, habitat types, environmentally significant areas, ecosystems, landscape types, monitoring and assessment of geological values and monitoring of the state of natural heritage.

Targets

Identification of the trend in populations for selected bird species and establishment of the reasons leading to reduction in their number and development and implementation of measures for the negative trend halting (contribution to the achievement of the Target 2010 for biodiversity loss prevention/reduction by 2010).

Assessment

Abundance and variety of species and ecosystems are the main features of biological diversity in the Republic of Macedonia. According to the available information, this wealth comprises the imposing number of around 18.000 taxa, out of which more than 900 taxa are Macedonian endemic taxa. According to the analysis of the richness of biodiversity in the countries of the European continent, the Republic of Macedonia is positioned at the very top of the list of states known as "European Hotspot".

The total number of registered bird taxa is 338 (319 species and 19 subspecies). 69 bird species found in the Republic of Macedonia have been included in the European Red List. From among "Emerald" species identified in the Republic of Macedonia (under the Resolution No. 6 of the Bern Convention), 115 species are birds.

In the period from 2003 until present, within the Project for vultures conservation, monitoring of the populations of Griffon Vulture and Egyptian Vulture has been carried out, accompanied also by monitoring of the Imperial Eagle. There is also older data on the said species, as well as on the Golden Eagle, Mediterranean Falcon, *Buteo rufunnus G.,* etc. However, this data should be analyzed again prior to use.

The implementation of the Project for common bird species monitoring was initiated in 2007 and, based on the below described methodology, preliminary data on the trend in certain bird species will be obtained in the course of the next several (three at minimum) years.

Data specification

Title of the indicator	Source	Reporting obligation
Species diversity	− Grubac, B. & VELEVSKI, M. (2004): Survey and monitoring of the status, breeding success and threats to the Egyptian Vulture in Macedonia- 2004. MES. 28 pp. Report to BVCF/FZS.Емералд база на податоци − Grubac, B. & VELEVSKI, M. (2005): Survey and monitoring of the status, breeding success and threats to the Egyptian Vulture in Macedonia- 2005.	

Data coverage:

Species	Number
Griffon Vulture	
Year	couples
2004	21-25 couples
2005	14 couples
2006	9 couples
Egyptian Vulture	
year	couples
2004	35 couples
2005	31 couples
2006	30 couples

General metadata

Code	Title of indicator	Compliance with CSI/EEA or other indicators		Classification by **DPSIR**	Type	Linkage with area	Frequency of publication
MK NI 009	**Species diversity**	CSI 009	Species diversity	**C**		biological diversity	

Geographical coverage: Republic of Macedonia

Temporal coverage:

- for common bird species: since 2007
- for selected birds of pray: since 2004

Frequency of data collection: annually

Methodology

■ ### Methodology for the indicator calculation

Sample quadrants (10 – 15) with a surface area of 1 km^2 will be selected at random and common bird species will be counted there by applying the method of linear transect. The counting will take place in the breeding period (15 April - 15 June), with intensity of two counts per year. Data will be statistically processed to show the rend in species at national level, for which minimum of three years research will be required.

With regard to birds of pray, full census has been envisaged, to cover breeding couples and identify their breeding success.

■ ### Source of applied methodology

The methodology used by the British Trust for Ornithology in their census of breeding birds in the United Kingdom will be used.

Uncertainty

■ ### Methodological uncertainty

Uncertainty derives from the level of expertise of researchers.

Future activities

■ ### Short-term activities

– Definition of indicators

– Selection of sample sites for common bird species

– Training of researchers in monitoring of selected species

a. Description of activity

Depending on the number of researchers and their experience, sample sites will be selected by random and birds will be counted within them. The total number of these areas is expected to range between 10 and 15 quadrants.

Training of the researchers is required, to include workshops and practical field work (birds identification, data collection and compilation)

b. Required resources

– Organization of two workshops for training in birds identification, data collection and compilation.

– Organization of workshops to increase the number of participants in the observers' network.

– Development of practical tools (interactive CD Rom) on birds identification.

– Procurement of optical equipment (binoculars).

– Preparation of birds identifier in Macedonian.

c. Status

Activities are in initial stage.

Deadline: 2010

■ Long-term activities

a. Description of the activity

– Permanent training of researchers and increase in the number of sample sites.

– Selection of other indicator sets and development of methods for their monitoring.

Deadline: 2010 - 2012

LIST OF ADITIONAL INDICATORS

The Work Group on biodiversity, nature and fishery indicators held three meetings, during which discussions focused on the definition of the national list of biodiversity, nature and fishery indicators, as well as supplementing and verifying the three proposed indicators submitted to the Government of the Republic of Macedonia.

The Work Group made an attempt to propose final list of indicators and experts extended several proposals to that end: three proposal indicators of live stock breeding as specific segment of agriculture related to the indicator under the SEBI 2010 and FAO; four proposal indicators of plant production, three proposal indicators of forests: it was also proposed to include the indicator of fires in this list, as well as one indicator of veterinary health measures. There was another proposal to develop a sub-indicator of fish under the indicator of genetic resources, while under the fishery – fish catch and production.

In order to simplify the work, it was proposed to group the indicators (e.g. wild species/habitats, forestry, agriculture, genetic resources, anthropogenic activity, fishery, etc.) and appropriate subgroups composed by the Work Group members to be formed accordingly. Where needed, additional experts should be invited. The final national list has not been developed yet. This certainly requires additional time, as well as financial resources.

Biodiversity indicators are informative tools summarizing data on complex environmental issues in order to present the state and the trend in biodiversity. They provide indication of how close we have reached to the achievement of certain defined goals, such as the global/ European Target 2010 – to reduce/prevent biodiversity loss by 2010.

Biodiversity indicators, regardless of whether assessed at national or global level, build bridges between policy creators and science. Policy creators set the targets and the measurable objectives, while scientists determine certain variables of biodiversity, monitor the current status and develop model to project the future status of biodiversity. A good monitoring programme should identify the biodiversity trend and provide guidelines for undertaking of adequate measures, i.e. interventions by policy makers.

Convention on Biological Diversity (CBD) has set indicators at global level in order to measure the progress towards the achievement of Target 2010, allocated to seven focal areas:

- protection of biodiversity components,
- promotion of sustainable use,
- analysis of threats to biodiversity,
- maintenance of goods and services to support human welfare,
- protection of traditional knowledge, innovation and practice,
- provision of equitable and balanced distribution of benefits resulting from the use of genetic resources, and
- enabling resource transfer.

Based on the above focal areas under the CBD and EU headline indicators and Pan-European Biological and Landscape Diversity Strategy (PEBLDS) at European level under the Project "Streamlining of European Biodiversity Indicators by 2010 (SEBI 2010), the first set of

European biodiversity indicators has been developed, as follows:

26 indicators have been proposed within the SEBI 2010 process:

1. Abundance and distribution of selected species
2. Red List Index for European species
3. Species of European interest
4. Ecosystem coverage
5. Habitats of European interest
6. Livestock genetic diversity
7. Nationally designated protected areas
8. Sites designated under the EU Habitats and Birds Directives
9. Critical load exceedance for nitrogen
10. Invasive alien species in Europe
11. Occurrence of temperature-sensitive species
12. Marine Trophic Index of European seas
13. Fragmentation of natural and seminatural areas
14. Fragmentation of river systems
15. Nutrients in transitional, coastal and marine waters
16. Freshwater quality
17. Forest: growing stock, increment and fellings
18. Forest: deadwood
19. Agriculture: nitrogen balance
20. Agriculture: area under management practices potentially supporting biodiversity
21. Fisheries: European commercial fish stocks
22. Aquaculture: effluent water quality from finfish farms
23. Ecological Footprint of European countries
24. Patent applications based on genetic resources
25. Financing biodiversity management
26. Public awareness

Considering the fact that the reporting obligation towards EEA and EU will be based on the above indicators, experts should focus their next activities on the elaboration of these indicators. Most of the indicators are complex/aggregate and thus several indicators can be proposed oriented towards the complex indicator and then to remove indicators that are not relevant for the Republic of Macedonia (e.g. Marine Trophic Index of European seas), etc.

In addition to the above, the issue of lack of data has to be settled, namely adequate monitoring programme should be prepared, relevant institutions and organizations for monitoring performing should be accredited as required, to monitor certain biodiversity components and continuous monitoring system should be established at national level.