

ROMANIA

Romanian Ministry of Waters, Forests and Environment Protection

Bucharest, 1998

FOREWORD

The Romanian territory is characterized by a large biogeographical diversity, with natural resources which constitute a natural heritage able to assure a harmonious and sustainable development of the country now and in the future.


A large variety of ecosystems, habitats and wild species, some of them priceless through their uniqueness, form the natural heritage of the country, which ensure a wealth of renewable natural resources. Many of the wild plant and animal species from the country's territory are endemic or relict with evolution significance, and other species like the brown bear, the lynx or the wolf which have disappeared or are hardly surviving in other European countries, in Romania they are in a very good state of conservation. In the same time, Romania's territory has a major importance in the area of migration of many wild animal species, of those state of conservation is of international importance. Forests and landscapes in their natural state, with the wealth of biological diversity, are proof of the deep understanding by the people of these places of the importance of natural heritage protection of which their past, present and future is bound. An important number of natural areas, among which there is the Danube Delta, are subject to a special regime of protection and conservation.

In the framework of this document there are underlined the most important features of the biological diversity state on the country's territory, threats to biological diversity, the priority objectives and the necessary means for the protection, conservation and sustainable use of the biological diversity components, in accordance with the objectives of the Convention on Biological Diversity, of the other relevant international conventions and agreements, of the Agenda 21, adopted in Rio de Janeiro in 1992, as well of the Pan-European Strategy for the Protection of biological Diversity and of the Landscapes.

In the name of the Romanian Government I express my thanks to all the international bodies and organizations and especially to UNEP, GEF, World Bank and Executive Secretariat of CBD for the permanent support granted to Romania, in different forms, for the substantiation of our national policy and strategy in the field of biological diversity conservation.

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**MINISTER OF WATERS, FORESTRY AND
ENVIRONMENTAL PROTECTION**



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1 Executive Summary

Romania is a country with rich biodiversity (ecosystems, species and genetic diversity) and a high percentage of natural ecosystems - 47% of the land area of the country is covered with natural and semi-natural ecosystems. Since almost half of all forests in Romania (13% of the country) have been managed for watershed conservation rather than production, Romania has one of the largest areas of undisturbed forest in Europe. The natural integrity of Romanian forest ecosystems is indicated by the presence of the full range of European forest fauna, including 60% and 40% of all European brown bears and wolves, respectively. Europe's largest wetland, the Danube Delta, also lies predominantly in Romania. Major grasslands, caves, and an extensive network of rivers, add to the ecosystem richness.

Important for Romania as well as for all Europe, is that the territory of Romania is a confluence point between biogeographic regions - between arctic, alpine, west and central European, panonic, pontic, balkanic, submediterranean and even eastern colchic, Caucasian and turanic-iranian regions. The high level of geographic diversity in Romania and the consequence of its location as a biological confluence place, has produced a floral diversity that includes over 3,700 species and a fauna diversity estimated to be more than 33,802 species. These figures include a large number of endemic and subendemic plants (228) and animals (1,000) specifically adapted to local conditions and only found in Romania. Species that once thrived in many parts of Europe are now only found in Romania or found in Romania in large or significant populations.

Although rich in biological resources and important as a corridor for the movement of species (biogenetic material), Romania has suffered the consequence of human activity. Pollution, the damming of rivers, hydrological works, industrial agriculture, overexploitation of natural resources, among other factors, have all taken their role in decreasing biodiversity. Highly sensitive mountain ecosystems are also particularly threatened by inappropriate forms of tourism and associated infrastructure development. This trend is likely to increase if appropriate measures to reduce the effects of pollution and of economic pressures connected with the overexploitation of natural resources will not be undertaken.

Taking into account these significant problems, Romania has an active governmental and non-governmental commitment to reverse the trends of biodiversity loss. A large number of areas (4.8% of the country's land area) have been designated as protected areas. However, a coordinated and effectively managed system of protected areas does not exist and institutional arrangements for nature conservation and protected area management have not yet been clearly defined.

In order to address these shortcomings, Romania has adopted National Strategy and Action Plan for the biological diversity conservation and sustainable use of its components, which integrate all principles and objectives of the Convention on Biological Diversity, of the most significant conventions in the field of nature and biodiversity conservation as well as of the Pan-European Biological and Landscape Strategy. The priority objectives of the National Strategy and Action Plan for the biological diversity conservation and sustainable use of its components are listed in Box 6.

2 Romania's Biodiversity

2.1 Overview

As a consequence of its geographical setting and the evolution of human society in the region, Romania has a unique and high level of biodiversity and intact ecological systems. The vast reed beds of the Danube Delta, the high density of large carnivores, and the extensive forests of the Carpathian mountains are some of the more significant and best known aspects of the biological riches of Romania.

2.2 Geographic Location and Climate

Romania is located in Central Europe at an equal distance between the North Pole and Equator and at an equal distance between the Atlantic and Ural Mountains. The total area of the country is 23839,100 ha. The elevation of the country varies significantly - the Danube Delta is located at sea level and the highest peaks of the Carpathian Mountains rise to over 2500 m. (Map 1)

In general Romania has a temperate climate with significant zonal aspects. Some regions have high humidity and low thermic amplitudes, dryer continental climate exists in other areas creating higher thermic amplitudes, while in the south and west the influence of the sub-Mediterranean warm and dry climate is felt. The average annual temperature is 8-10°C, with frosty winters (-3° to -4°C) and warm summers (21 to 22°C), and an average annual precipitation of between 400-600 mm. In Romania there is a major part of the existing soil types in Europe and varying levels of relief brought about by underlying volcanic, sedimentary, and metamorphic rocks. The biomes that existed on the country territory, prior to human modification, consisted primarily of forests (77%), steppe grasslands (16%), aquatic ecosystems and wetlands (5.8%) and alpine and subalpine ecosystems (1.2%).

2.3 Romania as Biological Confluence Place

Significant about Romania is that it is a confluence point between biogeographic regions - between arctic, alpine, west and central European, panonic, pontic, balkanic, submediterranean and even eastern colchic, Caucasian and turanic-iranian. The biodiversity therefore contains components that are eastern (Caucasian/pontic), northern (boreal), southern (Mediterranean and Balkanic), and western (continental european and panonic).

Important about the biodiversity of Romania is that it is a major confluence place of ecosystems from each point of the compass. The steppe xerophyllous, halophyllous, psamophyllous grassland ecosystems and the xerophyllous bush ecosystems have a direct linkage in the east with the steppe ecosystems from Moldavia and Ukraine.

The silvosteppe ecosystems can be found in the east in Moldavia, in the south in Bulgaria, in the west in Hungary and Yugoslavia. The xerotherme broadleaved forest ecosystems reflects the presence in the north of similar ecosystems from Bulgaria and Yugoslavia. The mesophyllous broad-leaved forest ecosystems have very strong linkages with the forests from the peripheral hills from the Pannonian Plains in Hungary, from Slovakia, the Czech Republic, Poland, the mountainous Ukraine and also from the Yugoslavian and Bulgarian mountains.

The boreal spruce and larch forest ecosystems are common in the entire Carpathian chain and can be found in Ukraine, Poland, Slovakia but also in the mountains from the Balkanic Peninsula. The alpine and subalpine grasslands and bushes have linkages both to the north in the Carpathian chain from the neighbouring countries and in the mountains from the Balkanic peninsula.

In most cases while the forest and grassland ecosystems from neighbouring countries are similar in general structure they differ in abundance and composition of elements of flora and fauna. Romania is a confluence place of each of these ecosystems and a territory through which many species have spread their distribution. The largely unbroken Carpathian mountain chain and the Danube river and its tributaries are particularly important in providing a corridor for the spread of biodiversity.

2.4 Ecosystems Diversity

The extensive range of ecosystems types in Romania is largely the result of the influence of climate and elevation. Of major importance in affecting ecological conditions are the Carpathian mountains, 60% of which are in Romania. In total 17 major terrestrial ecosystem formations exist including all the major ecosystem types existing in Europe (see table 1). There is also a rich diversity of aquatic ecosystems including river floodplains, glacial lakes, coastal wetlands, bogs, and mountain rivers. Map 2 depicts the 22 ecoregions identified in Romania.

In the more humid regions, at lower altitudes (up to 300 m), broad-leaved forest are predominant. In the less humid climate there are the steppe grasslands, and in the mixing zone between the two regions there is a zone of silvosteppe containing a mix of forests and grasslands. The elevation change brought about by the Carpathian mountains brings an abundance of biogeographical

TABLE 1:

MAIN GROUPS OF ECOSYSTEMIC FORMATIONS OF ROMANIA, NUMBER OF ECOSYSTEM TYPES, THEIR PRESENT STATUS AND TERRITORIAL DISTRIBUTION

Nr.	Ecosystemic formations	Nr. of Ecosystems Types	Present status	Territorial Distribution (Occurence)
1	Boreal coniferous forest	41	underived primary seminatural, partly natural	Uninterrupted main territory in the Eastern Carpathians and interrupted in the Middle Carpathians between 1,200 - 1,800 m
2	Mesophyllous broad-leaved forests	50	underived primary semi-natural, partly natural	Uninterrupted territory in all the mountains and hills between 300 - 1,200 (1,400) m and partially in South and West of Romania
3	Higrophyllous broad-leaved forest	2 4	underived and derived primary semi-natural	Main territory in the large floodplains from the plain to which it is added the hill and mountain floodplain
4	Xerotherme broad-leaved forests	36	underived and derived primary semi-natural	Main territory in the plain and low hills from the South, West and centre of Romania with a dry climate
5	Cryophyllous alpine grasslands	16	primary natural	Fragmented territory, the alpine peaks more than 2,000 - 2,200 m high
6	Mesophyllous grasslands	67	underived and derived secondary semi-natural	Territory overlapping the boreal and mesophyllous forests (between 500 - 1,800 m)
7	Higrophyllous grasslands	151	underived and derived secondary semi-natural	Territory overlapping the hygrophyllous forests from the floodplains
8	Xerophyllous and serotherme grasslands	115	derived primary natural	Main territory in the low plain from the East, South and West of Romania
9	Psamophyllous grasslands	1?	underived and derived primary semi-natural, partly natural	Very restricted territory of about 100,000 ha in the NW of Romania (Carei), SW (Danube terraces) and S (the terraces Vadu Ialomitei, Buzau, Birlad) the Danube Delta.
10	Halophyllous grasslands	58	underived semi-natural natural	Restricted territory to the halomorpe soils in the Western Plain and the Romanian Plain and the seaside

Nr.	Ecosystemic formations	Nr. of Ecosystems Types	Present status	Territorial Distribution (Occurrence)
11	Saxicole and petrophyllous formations	99	primary natural	Micro-territories in the alpine and subalpine territories (partly in the boreal and mesophyllous broad-leaved ones) from the Carpathians.
12	Mountain and subalpine herbs	35	primary natural	Territory overlapping the inferior subalpine and boreal mesophyllous forests (the superior part)
13	Cryophyllous small alpine bushes	6	natural	Fragmented territory on the alpine peaks ... between 2,000 - 2,200 m)
14	Subalpine bushes	6	primary natural underived and derived semi-natural	Fragmented territories in the subalpine layer of the Carpathians (1,800-2,200 m)
15	Mesophyllous and submesophyllous bushes	20	secondary natural	Fragmented territory overlapping that of the mesophyllous and partly the xerotherme forests
16	Xerophyllous bushes (steppic)	4	primary and secondary natural	Territory overlapping the xerophyllous grasslands which are now almost totally destroyed
17	Higrophyllous bushes	11	primary natural	In floodplains and swamps

zones which include four main types; the nemoral - with broad-leaved forests, boreal (horizontal) with coniferous forests, subalpine (vertical), and alpine (vertical). This latter one contains grass and small bushes.

A rich hydrological network contributes to the enhancement of biodiversity (see Map 3). Over 1000 km of the Danube River and numerous tributaries flow through Romania. Where the river empties into the Black Sea the 580,000 ha Danube Delta (113,000 ha permanently covered by water) has been formed. This is the largest delta in Europe, which conserves a very high biodiversity specific to wetlands. Since 1190 Danube Delta has received the status of Biosphere Reserve and since 1991 was registered as Ramsar Site and world natural heritage site. Details about Danube Delta Biosphere Reserves are presented in Box 5.

Romania also has a large portion of the Black Sea coast (228 km) and associated sand dune and coastal ecosystems. The over 8,000 caves, located primarily in the south-west of the country, add to the richness of the ecosystem diversity.

2.5 Species Diversity

Romania is rich in species diversity. In total about 3,700 species of higher plants exist in Romania. Among them, 39 species are endangered, 171 species are vulnerable and 1,256 are rare species (according to the Red List of Higher Plants of Romania, elaborated by the Romanian Academy 1994). Grassland species include 37% of the total species represented, 74 species of higher plants are extinct. About 600 species of algae and a total of over 700 species of marine and coastal plants exist. Only about 600 of these species are associated with human cultivation. A very high percent of the species of plants (4%) are endemic. In total there are 57 endemic taxa (species and subspecies) and 171 subendemic taxa (with their territory mostly in Romania). See Table 2.

Seventy-five percent of the endemic and subendemic species are found in the Carpathian mountains. *Andryala Zevitomentosa*, for example, can only be found in the Bistrita mountains, *Dianthus callizonus* only in Piatra Craiului, *Astragalus peterfii* only in Cluj county, *Draba dorneri* in Retezat mountains, and *Dianthus spiculifolius*, *Helictotrichon decorum* can be found in the entire Carpathian chain. The main endemic centres for plants are the Mountains of Rodna, Bistrita-Ceahlau, Bucegi-Piatra Craiului, Retezat-Godeanu, parts of these mountain massifs being declared as national parks.

TABLE 2

THE LIST OF THE ENDEMIC PLANT SPECIES FROM ROMANIA

No	Species	Geographic area	Freq.	Habitat
0		2	3	4
1	<i>Andryala (Pietrosia) levitomentosa</i>	the Eastern Carp (Bistritei M ⁴)	v. rare ⁵	r-r ³
2	<i>Anthemis carpatica</i> ssp. <i>pyrethriiformis</i>	the Eastern Carp	spor ⁶	mead ⁹
3	<i>Aquilegia nigricans</i> ssp. <i>subscaposa</i>	the Rom ⁷ Carp	spor	mead
4	<i>Astragalus excapus</i> ssp. <i>transsilvanicus</i>	Cluj, Alba cs	rare	mead
5	<i>Astragalus peterfii</i>	Cluj c ⁸	rare	mead
6	<i>Astragalus pseudopurpureus</i>	Bacau, Bicz cs	rare	r-r
7	<i>Astragalus roemeri</i>	the Rom Carp	rare	r-r
8	<i>Athamanta turbith</i> ssp. <i>hungarica</i>	the Southern Carp	rare	r-r
9	<i>Barbarea lepusnica</i>	the Southern Carp (Retezat, Godeanu Ms)	rare	wl ¹⁰
10	<i>C a m p a n u l a romanica</i>	Romania (Dobrogea) ¹	spor	r - r
11	<i>Carduus kernerii</i> ssp. <i>lobulatifolius</i>	the Godeanu M	spor	mead
12	<i>Centaurea jankae</i>	Tulcea c	v. rare	mead
13	<i>Centaurea phrygia</i> ssp. <i>rarauensis</i>	the Rarau, Harghita M	rare	mead
14	<i>Centaurea phrygia</i> ssp. <i>retezatensis</i>	the Retezat M	rare	mead
15	<i>Centaurea pirmatifida</i>	the Rom Carp	spor	mead
16	<i>Centaurea pontica</i>	Romania (seaside)	rare	s-r ¹¹
17	<i>Centaurea trichocephala</i> ssp. <i>simonkiziana</i>	Romania (Transsylvania, Banat)	spor	mead, gl ¹²
18	<i>Cephalaria radiata</i>	Romania (Transsylvania, Banat)	rare	mead, bs ³
19	<i>Cerastium transilvanicum</i>	the Southern, Eastern Carp	spor	mead
20	<i>Delphinium simonkaianum</i>	the Western, Eastern Carp (the Gilau, Trascau, Harghita Ms)	spor	r-r
21	<i>Dianthus callizonus</i>	Piatra Craiului	rare	mead, r-r
22	<i>Dianthus glacialis</i> ssp. <i>gelidus</i>	the Southern, Eastern Carp	spor	mead
23	<i>Dianthus henteri</i>	the Southern Carp	spor	mead
24	<i>Dianthus spiculifolius</i> (<i>D. petraeus</i> ssp. <i>the spiculifolius</i>)	the Rom Carp	freq. ⁷	mead, r-r
25	<i>Dianthus tenuifolius</i> (<i>D. carthusianerum</i> ssp. <i>tenuifolius</i>)	the Rom Carp	freq	mead, r-r
26	<i>Draba dorneri</i>	the Retezat Ms	rare	r-r
27	<i>Draba haynaldii</i>	the Southern, Eastern Carp	spor	r-r
28	<i>Draba simonkaiana</i>	the Paring, Retezat Ms	rare	r-r
29	<i>Festuca buccgiensis</i> (<i>glacialis</i>)	the Southern Carp (the Bucegi, Fagaras, Paring Ms)	spor	mead, bs
30	<i>Festuca nitida</i> ssp. <i>flaccida</i>	the Southern, Eastern Carp	spor	mead
31	<i>Festuca pachyphylla</i>	the Southern, Eastern Carp	spor	mead, r-r
32	<i>Festuca versicolor</i> ssp. <i>dominii</i>	the Rodnei Ms	freq	mead, r-r
33	<i>Fumaria jankae</i>	Bihorec	v. rare	mead
34	<i>Galium baillonii</i>	the Southern Carp (Mehedinu, Gorj, Vileca, Sibiu cs)	rare	for ¹⁴ , r-r
35	<i>Helictotrichon decorum</i>	the Rom Carp	spor	r-r

36	<i>Hepatica transilvanica</i>	the Southern, Eastern Carp (the Birsei Ms)	spor	for, bs
37	<i>Hesperis matronalis</i> ssp. <i>moniliformis</i>	the Southern, Eastern Carp	spor	bs, gl, mead
38	<i>Hesperis oblongiflora</i>	the Southern, Eastern Carp (the Birsei Ms)	spor	mead
39	<i>Hieracium praebiharicum</i>	Alba c	rare	mead
40	<i>Linum uninode</i>	Harghita, Cams-Sever-in, Mehedinti, Gorice	spor	r-r
41	<i>Lychinis nivalis</i> (<i>Polyschemone</i> (<i>Silene</i>) <i>nivalis</i>)	the Rodnei Ms	rare	mead
42	<i>Minuartia cataractarum</i> (<i>M.hirsuta</i> ssp. <i>Portile de Fier cataractarum</i>)		rare	r-r
43	<i>Onobrychis montana</i> ssp. <i>transilvanica</i> (<i>O.transilvanica</i>)	the Southern, Eastern Carp	spor	r-r
44	<i>Ornithogalum orthophyllum</i> ssp. <i>acuminatum</i>	Brasov c - Timpa	rare	gl
45	<i>Ornithogalum orthophyllum</i> ssp. <i>samophilum</i>	Ialomita c - Sacuieni	rare	s-r
46	<i>Papaver corona-sancti-stephani</i> (<i>P.pyrenaicum</i>)	the Southern, Eastern Carp	rare	r-r
47	<i>Poa granitica</i> ssp. <i>disparilis</i>	the Southern, Eastern Carp	spor	mead
48	<i>Primula auricula</i> ssp. <i>serratifolia</i>	the Southern Carp (Vilcan, Godeanu, Cemei Ms) ⁷	rare	mead, r-r
49	<i>Primula wulfeniana</i> ssp. <i>baumgarteniana</i>	the Southern Carp (the Postavaru, Piatra Craiului Ms)	rare	mead
50	<i>Salvia transilvanica</i>	Maramures, Alba, Harghita, Hunedoara, Arges, Buzau cs)	spor	mead
51	<i>Saxifraga mutata</i> ssp. <i>depressa</i> (<i>S.depressa</i>)	the Southern Carp (the Birsei Ms)	spor	r-r
52	<i>Silene dinarica</i>	the Southern Carp (Fagaras, Copzia, Godeanu, Bucesti, Cluj)	rare	mead
53	<i>Sorbus bordasii</i>	the Mehedinti, Cemei Ms	rare	r-r
54	<i>Thesium kernerianum</i>	the Ciucas, Bucegi, Piatra Craiului Ms	spor	mead, r-r
55	<i>Thelapsi dacicum</i> ssp. <i>banaticum</i>	the Southern Carp (the Paring, Mehedinti, Tarcu, Godeanu Ms)	spor	mead, bs
56	<i>Thymus bihariensis</i> (<i>marginatus</i>)	the Rom Carp	spor	mead
57	<i>Viola jooi</i>	Transsylvania, Banat, Olt, Muntenia, Moldavia	spor	r-r

Legend: 1 - Carpathians 5 - very rare
 2 - Mountain 6 - sporadic
 3 - Romanian 7 - frequent
 4 - county 8 - meadow

9 - rocky-region 13 - bushes
 10 - wetlands 14 - forest
 11 - sandy-regions
 12 - glades

After Ciocirlan 1988-90, Negrea and assistants 1989, Dîhoru and assistants 1991, Oltean and assistants 1994

THE LIST OF THE SUBENDEMIC PLANT SPECIES

NO.	Species	The Romanian area
0		2
1	<i>Achillea coarctata</i> ssp. <i>milefoliata</i>	
2	<i>Achillea schurii</i> (A. <i>oxyloba</i> ssp. <i>schurii</i>)	The Southern, Eastern Carp'
3	<i>Aconitum moldavicum</i>	The Carp.
4	<i>Aconitum tauricum</i> ssp. <i>hunyadense</i>	The Rom' Carp
5	<i>Adonis transylvanica</i> (hibrida)	
6	<i>Agropyron brandzae</i>	
7	<i>Agrostis moldavica</i>	
8	<i>Alchemilla dolichotoma</i>	
9	<i>Alchemilla sooi</i>	Poiana Brasov
10	<i>Allium fuscum</i> ssp. <i>fussi</i>	the Rom Carp.
11	<i>Alopecurus lauriformis</i>	the Southern, Eastern Cam.
12	<i>Alyssum borzeanum</i>	
13	<i>Alyssum obtusifolium</i> ssp. <i>caliacre</i>	
14	<i>Androsace villosa</i> ssp. <i>arachnoidea</i>	the Southern, Eastern Rom. Carp
15	<i>Antemis tinctoria</i> ssp. <i>fussii</i>	
16	<i>Aquilegia transilvanica</i>	the Carp
17	<i>Armeria barcensis</i> (A. <i>maritima</i>)	
18	<i>Armeria pocutica</i> (elongata)	the Northern Carp
19	<i>Asperula carpatica</i>	the Eastern Cam
20	<i>Astragalus australis</i> ssp. <i>bucsecsii</i>	
21	<i>Aubrietia intermedia</i> ssp. <i>falcata</i>	the Carp
22	<i>Betula pubescens</i> ssp. <i>carpatica</i>	the Carp
23	<i>Campanula carpatica</i>	the Carp
24	<i>Campanula rotundifolia</i> ssp. <i>polymorpha</i>	the Carp
25	<i>Campanula serrata</i> (napuligera)	the Carp
26	<i>Campanula transilvanica</i>	
27	<i>Cardamine</i> (Dentaria) <i>glanduligera</i> (glandulosa)	the Carp
28	<i>Cardaminopsis neglecta</i>	the Carp
29	<i>Centaurea globurensis</i>	
30	<i>Centaurea havnaldiformis</i>	
31	<i>Centaurea phrygia</i> ssp. <i>carpatica</i>	Romania
32	<i>Centaurea pinnatifida</i> ssp. <i>oana</i>	
33	<i>Centaurea triumfetti</i> ssp. <i>oinnatifida</i>	
34	<i>Cephalaria uralensis</i> ssp. <i>multifida</i>	
35	<i>Chenopodium wolffii</i>	
36	<i>Chysosplenium alpinum</i> (C. <i>oppositifolium</i>)	the Carp
37	<i>Cochlearia borzeana</i>	the Eastern Carp - rare
38	<i>Colchicum havnaldii</i>	the Caras Sever-in. Mehedinti es ³
39	<i>Corydalis solida</i> ssp. <i>slivenensis</i>	
40	<i>Dactylorhiza cordigera</i> ssp. <i>siculorum</i>	the Eastern, Northern Carp
41	<i>Dactylorhiza maculata</i> ssp. <i>schurii</i>	the Carp
42	<i>Dianthus banaticus</i>	the Caras Severin, Mehedinti es

0	1	2
33	<i>Dianthus camoestrus</i> ssp. <i>serbanii</i>	
44	<i>Dianthus dobrogensis</i>	Dobrogea - rare
45	<i>Dianthus giganteus</i> ssp. <i>banaticus</i>	
46	<i>Dianthus guttatus</i> ssp. <i>racovitzae</i>	rare
47	<i>Draba kotschyi</i>	
48	<i>Erigeron acer</i> <i>polymorpha</i>	the Carp
49	<i>Erigeron nanus</i>	the Carp
50	<i>Eritrichium nanum</i> ssp. <i>jankae</i>	the Carp
51	<i>Erysimum hungaricum</i>	
52	<i>Erysimum wilmannii</i>	the Southern, Eastern Carp
53	<i>Erytronium dens-canis</i> ssp. <i>niveum</i>	
54	<i>Festuca carpatica</i>	the Southern, Eastern Carp
55	<i>Festuca gautieri</i> ssp. <i>lutea</i>	the Ram Carp
56	<i>Festuca porcii</i>	the Carp
57	<i>Festuca rupicola</i> ssp. <i>saxatilis</i>	the Southern, Eastern Carp
58	<i>Festuca scheuchzeriformis</i>	
59	<i>Festuca tatrae</i> (<i>F. amethystina</i> ssp. <i>tatrae</i>)	the Carp
60	<i>Festuca wagneri</i>	
61	<i>Galium moldavicum</i>	
62	<i>Genista tinctoria</i> ssp. <i>oligosperma</i>	the Southern Carp
63	<i>Gentiana phlogifolia</i> (<i>G. cruciata</i> ssp. <i>phlogifolia</i>)	the Southern, Eastern Carp
64	<i>Geranium sylvaticum</i> ssp. <i>coeruleatum</i>	
65	<i>Gypsophila petraea</i>	
66	<i>Heracleum carpaticum</i>	the Carp
67	<i>Heracleum palmatum</i>	the Rom Carp
68	<i>Hesperis nivea</i>	the Southern, Eastern Carp
69	<i>Hieracium borbasii</i>	Romania
70	<i>Hieracium fogaresense</i>	the Fagaras Mountain
71	<i>Hieracium kotschyarum</i>	Romania
72	<i>Hieracium magocsyarum</i>	the Retezat, Godeanu Mountains
73	<i>Hieracium ngoiense</i>	
74	<i>Hieracium pojoriteme</i>	the Eastern Carp
75	<i>Hieracium porphiriticum</i>	the Bihor, Mare Mountains
76	<i>Hieracium telekianum</i>	Harghita c
77	<i>Hypericum umbellatum</i>	Alba c
78	<i>Iris graminea</i> ssp. <i>brindzae</i>	
79	<i>Iris reinchenbuchi</i>	
80	<i>Jurinea mollis</i> ssp. <i>transsilvanica</i>	Transsylvania
81	<i>Knautia tulcensis</i>	
82	<i>Nocleria macrantha</i> ssp. <i>transsilvanica</i>	the Carp
83	<i>Larix decidua</i> ssp. <i>polonica</i>	the Carp
84	<i>Lathyrus transsilvanicus</i>	
85	<i>Leontodon montanum</i> ssp. <i>pseudotarascii</i>	the Carp
86	<i>Leontodon repens</i>	the Carp
87	<i>Lilium jankae</i>	
88	<i>Limonium bellidifolium</i>	

0	1	2
89	<i>Linaria bessarabica</i>	Buzau, Teleorman, Olt, Gorj cs
90	<i>Linum bessarabicum</i>	
91	<i>Linum borzeanum</i>	
92	<i>Linum perenne</i> ssp. <i>extraaxillare</i>	
93	<i>Melampyrum herbichii</i>	the Carp
94	<i>Melampyrum saxosum</i>	the Carp
95	<i>Melilotus arenaria</i>	Constanta c
96	<i>Micromeria pulegium</i>	
97	<i>Minuartia bilykiana</i>	
98	<i>Minuartia graminifolia</i> ssp. <i>hungarica</i>	
99	<i>Minuartia hirsuta</i> ssp. <i>cataractamm</i>	Romania
100	<i>Minuartia verna</i> ssp. <i>oxypetala</i>	the Rodnei Mountains
101	<i>Moehringia grisebachii</i>	
102	<i>Moehringia jankae</i>	
103	<i>Mvosotis transsilvanica</i>	
104	<i>Onosma arenaria</i> (ssp. <i>arenaria</i>) ^{2*}	Transsylvania
105	<i>Onosma heterophilla</i>	
106	<i>Onosma pseudarenaria</i>	Transsylvania
107	<i>Ornithogalum oreoides</i>	
108	<i>Oxytropis carpatica</i>	the Carp
109	<i>Paeonia officinalis</i> ssp. <i>banatica</i>	
110	<i>Papaver meoticum</i>	
111	<i>Pedicularis baumgartenii</i>	the Rom Cam
112	<i>Pedicularis limnogeria</i>	
113	<i>Peucedanum longifolium</i>	Romania
114	<i>Peucedanum rochelimum</i>	Romania
115	<i>Phyteuma tetramerum</i>	the Carp
116	<i>Phyteuma wagneri</i>	the Carp
117	<i>Pinus nigra</i> ssp. <i>banatica</i>	the Southern Carp
118	<i>Plantago schwarzenbergiana</i>	Romania
119	<i>Poa laxa</i> ssp. <i>pruinosa</i>	
120	<i>Poa molinerii</i> ssp. <i>glacialis</i>	
121	<i>Poa pannonica</i>	
122	<i>Poa rehmannii</i>	the Carp
123	<i>Pollegala supina</i> ssp. <i>hospita</i>	
124	<i>Potentilla chrysantha</i> ssp. <i>pastorum</i>	
125	<i>Potentill emilii-popii</i>	Romania
126	<i>Potentilla hvaldiana</i>	
127	<i>Prangos ferulacea</i> ssp. <i>carinata</i>	Mehedinti (Vărziorova) c
128	<i>Primula elatior</i> ssp. <i>leucophylla</i>	the Eastern Carp
129	<i>Puimonaria filarszkvna</i>	the Northern, Eastern Carp
130	<i>Pulsatilla halleri</i> ssp. <i>slavica</i>	the Northern Carp (Marzesti)
131	<i>Pulsatilla pratensis</i> ssp. <i>flavescens</i>	
132	<i>Pyrola carpatica</i>	the Carp
133	<i>Ranunculum carpaticus</i>	the Southern Eastern Carp
134	<i>Ranunculus flabellifolius</i>	Caras-Severin c

0	1	2
135	<i>Rhinanthus borbasii</i>	
136	<i>Rhinanthus wagneri</i>	
137	<i>Rosa cotiae</i>	Cozia, Capatinii Mountains
138	<i>Rubus chloroclados</i> ssp. <i>transsilvanicus</i>	Romania
139	<i>Saussurea porcii</i>	the Northern Carp
140	<i>Scabiosa</i> ssp. <i>barbata</i>	the Rom Carp
141	<i>Scabiosa useodobanatica</i> ssp. <i>barbata</i>	
142	<i>Scabiosa pseudobanatica</i> ssp. <i>pseudobanatica</i>	
143	<i>Serratula bulgarica</i> (S. <i>caput najae</i>)	
144	<i>Seseli gracile</i>	Transsvivania, Oltenia, Muntenia
145	<i>Seseli rigidum</i>	
146	<i>Sesleria bielzi</i>	
147	<i>Sesleria heufflerana</i>	the Carp
148	<i>Silene (Melandrium) zawadskii</i>	the Eastern Carp
149	<i>Silene conica</i>	
150	<i>Silene csersei</i>	
151	<i>Silene lorchfeldiana</i>	
152	<i>Silene nutans</i> (<i>dubia</i>)	the Rom Carp
153	<i>Sorbus dacica</i>	
154	<i>Sorbus paxiana</i>	
155	<i>Stipa crassiculmis</i> ssp. <i>heterotricha</i>	
156	<i>Stipa danubialis</i>	Mehedinti c
157	<i>Symphandra wanneri</i>	
158	<i>Symphytum cordatum</i>	the Carp
159	<i>Syringa josikaea</i>	the Western, Eastern, Northern Carp, Cluj
160	<i>Thlapsi dacicum</i>	the Southern, Eastern Car-o
161	<i>Thlapsi dacicum</i> ssp. <i>dacicum</i>	the Southern, Eastern Carp
162	<i>Thlapsi jankae</i>	
163	<i>Thlapsi pawlowskii</i>	
164	<i>Thyrus comosus</i>	the Rom Carp
165	<i>Thyrus pulcherrimus</i>	the Southern, Eastern, Northern Carp
166	<i>Trisetum fuscum</i>	the Carp
167	<i>Trisetum macrotrichum</i>	the Carp
168	<i>Trollius europaeus</i> ssp. <i>transsilvanicus</i>	
169	<i>Tulipa hungarica</i> (ssp. <i>undulatifolia</i>)	Caras-Severin c
170	<i>Verbascum glabratum</i> ssp. <i>brandzae</i>	
171	<i>Verbascum purpureum</i>	

Legend: 1- Carpathians
2- Romanian
3- county

by Ciocarlan 1988-90, Negrean and assistants 1989, Dihoru and assistants 1991, Oltean and assistants 1991

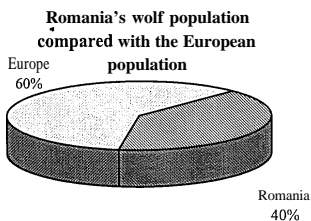
Box 1: Endemic and subendemic plant species of Romania

There are 57 endemic and 171 subendemic plant species in Romania. The endemic plants include 8 species listed as vulnerable, including, *Campanula romanica*, *Aquilegia nigricans*. Seven endangered species exist, including *Centaureapontica*, *Minuartia cataractarum* etc. An additional 25 species (i.e. *Cephalaria radiata*, *Galium bailloni*) are rare, including 2 which are very rare (*Andryala levitomentosa*, *Fumaria jankae*). The importance of these species is not only due to the fact they are endemic and that they are only found only in small areas of Romanian territory (the majority in the Romanian Carpathian chain), but also due to their economical values, melliferous (26 - *Anthemis carpatica* ssp. *pyrethriformis*, *Dianthus callizonus* etc.), medicinal (9 - *Primula auricula* ssp. *seratifolia*, *Viola jooi* etc.) or both (3 - *Thymus bihoriensis*, *Salvia transsilvanica* etc.). Without adequate conservation management their protection and sustainable use will be threatened.

Although Romania has a high level of plant diversity it is particularly important as a centre of population density for a variety of animals. Of greatest significance is the favorable state of populations of bears, wolves and lynx.

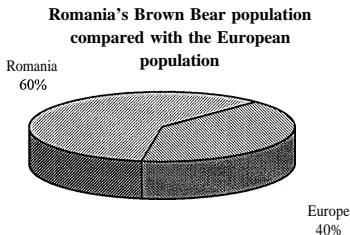
Originally wolves, bears and lynx were distributed over most of the European continent, however given the growth in human populations, human settlements, and livestock raising, the large carnivores were vigorously persecuted. In western Europe, large carnivores were, with few exceptions, decimated about 150 years ago.

About 40% of the European wolf population is found in Romania. Wolf (*Canis lupus*) populations exist in only four distinct areas of Europe, the northern Iberian peninsula (2,000), the Apennine and the Maritime Alps (400), the Dinarids (1,500) and the Carpathians (3,000).



Lynx populations (*Lynx lynx*) were eradicated from western Europe about 100 years ago. Reintroduction projects in Switzerland, Slovenia and the Czech Republic brought the species back into some areas of Central Europe in the seventies and eighties. The only healthy lynx populations in Europe, however, are in the Carpathians (1,000 - 1,500 individuals), Fennoscandinavia (more than 1,000) and in the Dinaric mountains (several hundreds). The Romanian population could therefore play an important role in preserving this species.

Brown bears live today in four distinct European populations: Carpathians (about 6,000 individuals), Fennoscandinavia (about 1,300) and Dinaric Mountains (about 2,000). 60 % of the European brown bear population lives in Romania.



All three large carnivore species are a symbol for wildness of habitats. Because of their ecological position at the top of the food pyramid they have a strong role on state of the ungulate populations. The state of the ungulate population has in turn a large influence on plant communities and overall ecological state. The maintenance of stable and healthy population of large carnivores in Romania provides a base for the repopulation of these species in other areas in Europe. A strategy for large carnivore protection in Europe is currently being developed by the World Wide Fund for Nature (WWF) and involves Romanian participation.

Romania has over 33,802 other species, sub-species and varieties of animals, out of which 33,085 invertebrates and 717 vertebrates. The vertebrates comprise a number of 191 species of fish, out of which 9 are endangered, 20 amphibian species, out of which 9 are endangered, 30 species of reptiles, out of which 6 are endangered, 364 species of nesting and migratory birds out of which 2 have disappeared and 6 are endangered and 102 species of mammals, out of which 2 have disappeared and 2 are endangered. Included in the insect fauna are 227 species specifically adapted to the underground life in caves - 97% of which are endemic. Of the total Romanian fauna over 1,000 species are considered endemic although the geographical distribution of many species is only poorly known.

Similar to the situation for plants, many animals are represented in Romania by subendemic species. This includes red deer (*Cervus elaphus montanus*), wild boar (*Sus scropha atilla*), European hare (*Lepus europeus transsilvanicus*), chamois (*Rupicapra rupicapra carapatica*), Willow Tit (*Parus montanus transilvanicus*). The main centres for the endemic fauna are located in the mountain massif of Rarau-Giumalau, Haghimasul-Mare, Fagaras, Paring, Cemei, Semic, Almaj, Bihor. (See 4).

Box 2: Romania's position in the migration routes of birds within Europe

Romania is a critical transit area for migrating birds within Europe. Romania is crossed by bird populations which are mainly migrating through the eastern part of the Mediterranean basin on the following route: Greece, Bosphorus - Nil Valley. The main migration zone of Romania is in the east between Carpathians and the Black Sea, Moldova, Dobrogea and the east of Muntenia. This zone is used by Red-Breasted Goose (*Branta ruficolis*) and the swans (*Cygnus cygnus* and *Cygnus olor* Black Stork (*Ciconia nigra*), Dalmation and European White Pelicans (*Pelecanus crispus* and *P. onocrotalus*), Glossy Ibis (*Plegadis falcinellus*). To this can be added the flyroute through the West Plain, part of the Tisa Plain, with a lateral branch along the Danube from east to west. This route is used by Crane (*Grus grus*) and Passeriformes. The secondary flyroute is the Transylvania basin, from northwest to southwest.

In the autumn, Romania is crossed by:

- populations from central-northern Europe flying primarily in a south-east direction;
- populations from eastern Europe (Russia, western Siberia) flying in a southwest direction to winter in the Balkans or on the Italian Peninsula;
- populations with unspecific directions migrating through Romania.

The return migration in the spring is almost the same, except for a few species, which have a slightly modified return route.

from the *Romanian Ornithological Society*

The Danube Delta and Black Sea coastal areas also have a particularly high level of endemic or subendemic species including 7 endemic fish species, 4 endemic mollusca, 21 endemic insects, subendemic sponges and a large number of worm, and crustacean species.

2.6 Genetic Diversity

Corresponding to the richness of species and habitats, Romania has a very high level of genetic diversity.

2.7 Human Influence on the Landscape

Today agricultural lands copies cca 62% out of the total surface of country, and arable lands, cca 39%. Pastures and hay fields represent around 20%. Forests was reduced to around 28% out of the total surface of country. (Map 4)

Human activities have historically significantly modified the landscape. These modifications have reduced the size, the abundance of certain elements of the ecosystem (most notably steppe grasslands, wetlands, river courses) and also added new components (especially hydrotechnical

works). Today arable land comprises 39.2% of the surface of the country and a large area of mesophyllous, hygrophyllous and xerophyllous secondary natural grasslands have been formed - primarily in the mountains and hills (see Map 4). The forests now are about one-third of their previous extent as a result of human activity. Although the forests have been reduced in area, they have retained a high level of natural species composition and quality. The area of wetlands has also been reduced to about half of its previous extent. The loss of wetlands has been particularly dramatic along the Danube River where many wetlands have been converted to agricultural use.

2.8 Economically Important Wild Species

All of the 58 species of autochthonous trees and at least 30 species of shrubs have an economical importance producing wood, resin, fruits, flowers, leaves and bark with medicinal character or representing honey sources.

Of the 1,300 species of grassland plants, 175 have nutritional value, 70 species are medicinal and 180 are melliferous (important for honey).

Of the forest and grassland animals 12 species of mammals and 7 species of birds have economical importance as game species. Twenty-nine species of freshwater fish have economic value including pike, carp, zander, sturgeon, and perch. For many local populations the utilisation of biological resources continues to be important for their nutritional well-being and economic health. Many others species, including in a large part microorganisms, have a great importance for different economical sectors.

Box 3

Categories of biological diversity components requiring monitoring measures, due to their economic, scientific or cultural importance, according to article 7 of the Convention on Biological Diversity:

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

3.Threats to Romania's Biodiversity

3.1 Overview

Although Romania is rich in biodiversity (particularly the large size and quality of valuable ecosystems and the quantity of some species) the country has suffered a progressive loss of biodiversity as a result of human activity. In particular, agriculture, industrial development, and urbanization have profoundly affected the biological diversity, both generally and locally. Pollution, alteration of river courses and hydrotechnical works, mineral resource extraction and overexploitation of biological resources have been the principle factors involved.

In total it has been estimated, that in the last fifty years, there has been a permanent loss of 250,000 ha of forest and grassland ecosystems and that an additional 280,000 ha have been temporarily or only partially lost. A total of about 400,000 ha of wetland habitat (much of it along the Danube River) has been permanently or partially lost as well.

3.2 Pollution

Air, water and soil pollution have been and continue to be major threats to biodiversity in Romania. Industrial pollution decreased in the last years of the economic transition process due to significant reductions in industrial activities. Agriculture runoff is also a major pollutant factor in some areas.

Part of the interior waters which could sustain a rich biological diversity is polluted and Danube brings from the upstream countries a pollution level with negative impact upon the river's biological diversity, as well as Danube Delta and Black Sea. The high nutrient load of the Danube River has caused eutrophication in the Danube Delta lakes where macrophyte, molluscs, benthic and fish species have consequently been reduced. This is particularly damaging to fish population but also to marine mammals.

3.3 Changes to the Hydrological Regime

Among the most significant ecological changes that have taken place in Romania has been the alterations to the course of rivers and the building of hydrotechnical works. In most instances these actions have had major negative consequences for aquatic biocoenoses and caused the loss of natural ecosystems and terrestrial habitats, as well as the loss of ecological equilibrium of these ecosystems on a large scale. The loss of groundwater as a result of hydrotechnical works has, for example, produced the partial or total drying out of about 20,000 ha of forests.

The draining of wetlands was promoted by the previous government in order to increase arable land for agriculture. This practice led to the loss of approximately 400,000 ha of floodplains, particularly along the Danube river and in the Danube Delta (80,000 ha). The embanking of the Danube River and the building of the Portile de Fier hydropower Plants has also had a major impact in destroying spawning areas and the breeding success of many fish species. Together with pollution this factor has led to a reduction of sturgeon harvest (50 times lower than previously reported) and carp (10 times lower than previously reported).

Box 4

Out of the 25 sturgeon species existent worldwide, 6 species are known for the Danube River Basin, namely: Beluga (*Huso huso*), *Acipenser guldenstaedti*, *Acipenser stellatus*, sterlet (*Acipenser rhetenus*), *Acipenser shui* and *Acipenser nudiventris*. Starting with the 60's, the last three species are considered to be disappeared or very rare within Romanian waters. The main causes for their decline are: shrinking of their spawning territory due to the hydrotechnical works, the increasing pollution of waters and overexploitation. The other three

3.4 Consequences of the Land Use

Estimates are that about 40% of the agricultural area is affected by erosion with an average rate of 16.5 t/ha/yr. Irrigation of agricultural land (about 3,200,000 ha in 1989) has also brought about increased salination on large areas. Overgrazing in some areas is also reducing soil resources (e.g. contribution to erosion, especially on slopes). Surface mining

3.5 Future Directions of Resources Use

Although, as it has been noted, there are a considerable number of damaging practices and activities affecting biodiversity in Romania the possibilities for reducing damage to biodiversity are large. Within the country there is a highly developed sense of the connection of people to the land and following the political changes of 1989 there has been a net return of people to rural areas.

Traditional harvesting and grazing practices in Romania present an opportunity to support a sizeable rural population which lives within the limits of the available biological resources. Tourism could be developed to provide such communities with additional sources of revenue while offering incentives to retain or revive traditional practices that are sustainable or to develop new means for using natural resources sustainable.

There is a great potential to develop ecological tourism activities in many of Romania's natural areas. A newly formed association of ecological tourist homes and farms is currently promoting this idea. Some small projects are already in place and other larger ones have been proposed.

Romania faces many changes as it moves towards a market economy. As the country's economic wealth grows in the future, new environmental pressures and challenges will arise. The private ownership of land, rises in personal consumption and the manufacture of consumer goods, the privatisation and decentralisation of industry, will (if such changes come) bring both new threats as well as new opportunities for the protection of biodiversity. Although there has

been considerable human modification to the Romanian environment the potential exists for Romanian development to proceed in a manner that protects the country's valuable biological resources and at the same time improves the country's economic well being.

4 Legal and Institutional Framework for Biodiversity Conservation and Sustainable Use of Its Components

4.1 Overview

Romania has demonstrated its interest in, and commitment to, the conservation of biodiversity and natural areas through signing of international agreements, the passage of national regulations and the designation of a large number of protected areas. Despite these efforts Romania has experienced difficulties in implementing policies and strategies to achieve effective biodiversity conservation. Beside a lack of financial resources, there is a lack appropriate institutional structures for biodiversity conservation.

Within Romania there is an good foundation of scientific research and well trained scientists. However scientific research is largely uncoordinated and data and information that is collected is neither centralised nor easily accessible. A well defined and coordinated institutional structure for evaluating, monitoring and managing protected areas in Romania is needed.

4.2 International Agreements

Romania has ratified the Convention on Biological Diversity and of major significance this is legally binding within Romanian law. This not only underscore Romania's commitment to the principle of biodiversity conservation, but it also provides a legitimacy for incorporating biodiversity protection into the Romanian regulatory framework. The difficult task has been to incorporate biodiversity conservation principles effectively into coherent policies in all economic sectors, to develop and implement effective management plans for protected areas, and to achieve enforcement of laws.

Romania is also an active participant in regional environmental initiatives such as the Danube Environmental Programme, the Black Sea Environment Programme, and the Environment for Europe process. The Danube and Black Sea Programmes, which are largely focused on water quality improvement, have recognised the important connection that exists between land-use management water quality and biological diversity conservation.

Box 5: International Conventions in the field of biodiversity conservation ratified of Romania

Romania is a Contracting Party to seven international conventions related to biodiversity conservation, namely:

- Convention on the Protection of World Cultural and Natural Heritage (Paris) - Law 178/1990
- Convention on Wetlands of International Importance Especially as Habitat for Waterfowl (Ramsar) - Law 5/1991
- Convention of the Prevention of Marine Pollution (London) - Law 6/1993
- Convention for the Conservation of European Wildlife and Natural Habitats (Bern) - Law 13/1993
- Biological Diversity Convention (Rio de Janeiro) - Law 5 8/1 994;
- Convention on International Trade with Endangered Species (Washington) - Law 69/1994
- Convention on Climate Change (UNO) - Law 24/1 994;
- Convention on Migratory Species (Bonn) was recently ratified by the Romanian Parliament. - Law 13/1998, and UN Convention to combat desertification is under ratification;

According to Art. 11 of the Romanian Constitution, all international treaties ratified by Romania's Parliament become part of internal legislation.

4.3 Existing Legislation

A new law for Environmental Protection (Law 137/1995) passed in December 1995 is a framework law that is intended to be completed with additional specific law relating to protected areas.

There are also various national laws and regulations that relate to biological diversity and that attempt to support nature protection and conservation within Romania

4.4 Conservation Administration and Policy

The largest part of the governmental responsibilities for nature protection and management belong to the Ministry of Waters, Forests and Environmental Protection (MWFEP) and the branches or agencies affiliated with the MWFEP. The Commission for the Protection of Nature Monuments of the Romanian Academy is the legal scientific authority for nature conservation and protected areas.

Box 6: The Three Biosphere Reserves in Romania

Danube Delta Biosphere Reserve (DDBR) is the largest and least damaged wetland complex in Europe, covering a total area of 580,000 ha. The significance of the biodiversity of the Danube Delta has been internationally recognised. It was declared a Biosphere Reserve in September 1990, a Ramsar site in May 1991, and over 50 % of its area was placed on the World Heritage List in December 1991. Within its boundaries is one of the most extensive reed bed systems in Europe. The Danube Delta has considerably more breeding species than other south European deltas; these include a major portion of the world population of pygmy cormorant, half the Palearctic breeding population of white pelican and five per cent of the world breeding population of Dalmatian pelican. It is likely that the Delta is one of the last European refuges of the European mink and there are also a number of other important small carnivore species. Within the reserve, a number of 18 strictly protected areas with a total surface of 50, 600 ha were delineated. DDBR is the only protected area in Romania with an administrative structure, a management plan and its own law.

Retezat National Park, located in the western part of Romania, is the oldest national park, being established by law in 1935. The park has a surface of 54,400 ha, of which 1,800 ha have been declared as strictly protected area called "Gemenele". The universal value of the park was recognised by the Man and Biosphere Programme of UNESCO in 1979 through its inclusion in the international network of biosphere reserves. In the lower part of the park there are deep narrow valleys, while the higher parts consist of glacial plateaux with more than 80 glacier lakes. The largest single area of pristine mixed forest in Europe covers the lower levels of the strictly protected area. The vegetation is rich, and because of its location between different vegetation zones, 5.2 % endemic plant species are present, among them *Draba dorneri* which can be found only on a small area. The Retezat Mountains are considered to be the European genetic centre for *Poa* and *Hieracium*. Viable populations of large mammals, including brown bears, wolves, lynx, wildcat, wild boar, roe and red deer, and chamois populate the area, together with a large number of small carnivores including at least 8 species of mustelids (badger, otter etc.)

Rodna National Park represents the largest protected area located in the northern group of the Eastern Carpathians covering a surface of 56,700 ha. In 1980 it was declared a Biosphere Reserve under UNESCO - MAB Programme. The massif is dominated by metamorphic formations belonging to Precambrian or Palaeozoic periods with slopes reaching 20 -35°. The carst from the northern part of Rodnei Mountains is one of among the few places in the Romanian Carpathians where typical exocarstic forms appear. These forms of morphostructural conditioning confer a uniqueness to the limestone surfaces here. The flora is significant because of the presence of the local and Carpathian endemic species together with glacier relicts. The vertebrate fauna is extremely variable including large birds, such as black grouse, capercaillie and eagles, as well as large carnivores (lynx, brown bears and wolf). Inside the Park there are nine reserves (IUCN category I and IV) and one natural monument.

The forestry national authorities manages over 6,300,000 ha of forest and is mandated to manage them sustainable. Valuable about Romanian forests is the large number, and quality and size, of natural or near natural forests. See Table 3.

Particularly important examples exist in Piatra Craiului and Bucegi. These areas are valuable examples of previously existing forests in Europe and can be an important biological reserve and template for restoration of forests in other parts of Europe. In 1995 a national forestry management strategy was developed with short, medium, and long-term plans. Each of these contain regulations concerning biodiversity conservation in protected areas and forests. While there has been some encouraging progress in the management of forests there is as yet no such management plans for grasslands or steppe ecosystems within Romania. These areas also contain important species in need of protection.

Table 3: The main protected virgin forests in Romania

Nr.	Name of the forest	Surface [ha]	Type of forest
1	Piatra Craiului	1932 + 1459	Spruce forest, Mixed beech and coniferous
2	Runcu-Grosi	932	<i>Quercus sessiliflora</i> forests
3	Vorona	150	Mixed forest of <i>Quercus sessiliflora</i> , beech and lime
4	Tudora	120	Mixed forest of <i>Quercus sessiliflora</i> , beech and lime
5	Bucegi	1634 + 3748	Larch, spruce forests; mixed beech and fir forest
6	Izvoarele Nerei	6261	Beech forests
7	Domogled	2743	Black pine (<i>Pinus nigra</i> var. <i>bannatica</i>) forest; Beech forest on limestone
8	Dognecea Forest	316	Mixed forests of <i>Q. sessiliflora</i> , <i>Q. cerris</i> , <i>Q. frainetto</i> , lime and beech
9	Rachiteanu Forest	1200	Montane beech forest
10	Humosu	73	Hill beech forest
11	Slatioara	854	Mixed forest of beech, fir and spruce
12	Giupalau	314	Spruce forests
13	Letea	2825	Oak, ash and poplar forest on maritime sands
14	Caraorman	2250	Oak, ash and poplar forest on maritime sands
15	Latorita	7	Larch forests
16	Retezat	13,000	Spruce forest; Mixed beech, fir and spruce forest; beech forest; pine forest
17	Calimani		Mixed forest of spruce and <i>Pinus cembra</i> ; spruce forests
18	Polita cu Crini	370	Mixed spruce, larch, spruce, beech forest; Larch and spruce forests
19	Cozia		Beech forests; mixed beech- coniferous forest; <i>Q. sessiliflora</i> forest
20	Vidalm		Larch forests

4.5 Research and Scientific Activities

Romania has a strong scientific research tradition in the natural sciences. Scientific research is carried out by various universities, organisations and institutions. There is a national research programme in ecology, together with local applied research programmes that are addressing

various aspects of biodiversity and nature conservation. A primary drawback is that research and scientific activities are not coordinated or prioritised. Further there is no **centralised** system for organising and disseminating information. An analysis of the various research activities should be undertaken in order to develop a coherent, focused, and cost effective research programme for biodiversity conservation.

Not always connected with university and research programmes there are a number of initiatives for ex-situ conservation in botanical gardens, parks, dendrological collections, flower collections, aquariums, terrariums, gene banks, and collections of micro-organisms that are of interest for agriculture, for food and other industrial sectors, and for a variety of other biotechnological applications that are now developing.

4.6 The Role of NGOs

Since the political changes in 1989 environmental NGOs have played an increasingly important role in environmental issues in Romania. The number of NGOs has increased to almost 200.

NGOs, including highly professionalized groups and local volunteer organisations, have undertaken a wide range of initiatives, including contributing pressure to achieve policy or management improvements and organising various field activities (garbage clean-up, species protection, acting as wardens etc.). Together with local, regional, and international governments and agencies and institutions, NGOs have also often organised or participated effectively in cooperative projects in the interest of biodiversity conservation.

The **Romanian** government acknowledges the importance of public participation as well as the importance to the democratic process of NGOs. As yet, however, there are only limited official means for NGOs to voice their opinions or provide direct input into official decisions affecting the management of biodiversity.

5. National Strategy and Action Plan for Biodiversity Conservation and Sustainable Use of its Components

The current status and threats to biodiversity in Romania have been presented in the previous sections. In order to ensure that the existing biodiversity is maintained and damaged ecosystems restored, Romania has developed on 1996, with support from GEF/World Bank, a National Strategy and Action Plan for Biodiversity Conservation and Sustainable Use of its Components. It should be noted that the developed strategy and actions plan have integrated the principles and objectives of the Convention on biological diversity conservation, the Pan-European Biological and Landscape Diversity Strategy, as well as the most pertinent international conventions and agreements in the field of nature and biodiversity conservation.

Box 7: Priority Objectives for Biodiversity Conservation and Sustainable Use of its Components in Romania

1. Development of the legislative framework and strengthening the institutional capacity for biodiversity conservation and sustainable use of its components.
2. Organisation of the national network of protected areas and ensuring their efficient and adequate management for the natural habitats protection and biodiversity conservation.
3. Conservation of threatened, endemic, and/or rare species with a high economic value in situ and ex-situ.
4. The integration of the National Strategy for the Biodiversity Conservation and Sustainable Use of its Components within the National Strategy, as well as within the sectorial and local strategies, plans, programmes and policies for the national and local sustainable development.
5. The protection, conservation and restoration of the terrestrial and aquatic biodiversity outside protected areas through (1) reducing the negative impacts of pollution, natural resources overexploitation and inappropriate land-use practices and (2) restoring altered ecosystems and habitats.
6. Protection, conservation and restoration of the biological diversity specific to agrosystems through the implementation of the technologies which favour sustainable agriculture.
7. Training specialists and the general population in the spirit of biodiversity conservation and sustainable use of its components.
8. Involvement of NGOs and local communities in programmes and actions for biodiversity protection, conservation and restoration.
9. Conducting of special research and monitoring programmes for improving the knowledge of the biodiversity status.

The following general conclusions form the basis of the objectives and actions selected for the biodiversity strategy:

- The losses of valuable natural resources through the reduction of biodiversity must be halted.
- Appropriate measures must be undertaken to ensure the long-term survival of species and ecosystems threatened by pollution, unsustainable use or by over-exploitation, etc.
- There is an urgent need for intervention to save representative species and ecosystems currently threatened.

benefits when protected, restored and effectively managed. At this can be added the habitats with high aesthetic landscape value which can be rendered through ecotourism.

Habitats and Species Whose Conservation and/or Sustainable Management Can Provide Educational Benefits

Part of the habitats and species whose sustainable conservation and management can bring educational benefits, are contained in protected areas, national parks and biosphere reserves.

Threatened Habitats and Species which Must Be Controlled Through Special Regulations

The utilisation of the grasslands, especially those on steep hills should be regulated and strictly controlled in order to prevent their degradation and reduction of biodiversity through overgrazing and erosion. Strict regulations and permanent control over those who gather and sell plants and animals from wildlife are needed in order to avoid the loss of valuable species and to ensure their sustainable use. Also special regulations should be issued in order to prevent the reduction of the biodiversity in agroecosystems. A positive example of control through special regulations for threatened habitats and species exists in the Danube Delta Biosphere Reserve where the Administration has developed several special management measures.

According to the Bern Convention, ratified by Romania, and to the recommendations issued by the Council of Europe, specific plans and regulations shall be developed in Romania for the protection of the following bird species: *Numenius tenuirostris*, *Falco naumanni*, *Crex crex*, *Phalacrocorax pygmeus*, *Oxyura leucocephala*, *Pelecanus crispus*, *Branta ruficolis*, *Anser erythropus*, *Aquila heliaca*, *Otis tarda*.

5.2 Legal and Institutional Reform

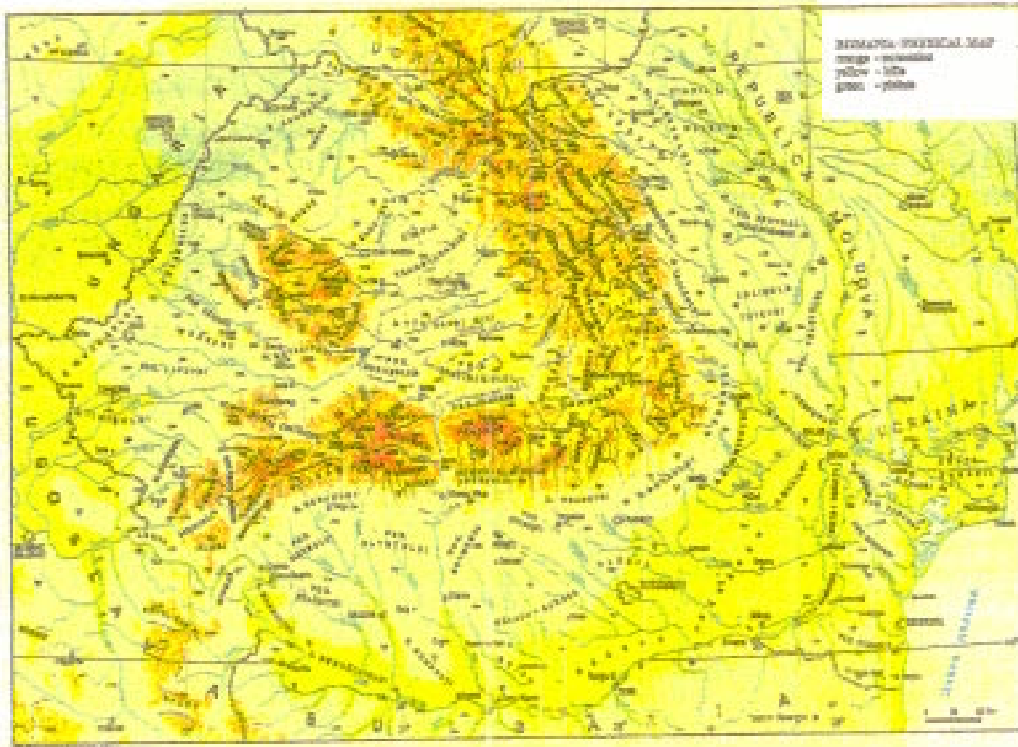
Actions targeted at species and habitats alone are recognised as insufficient to protect biodiversity in Romania. Institutional reform and development are needed as well. In particular there is a need for:

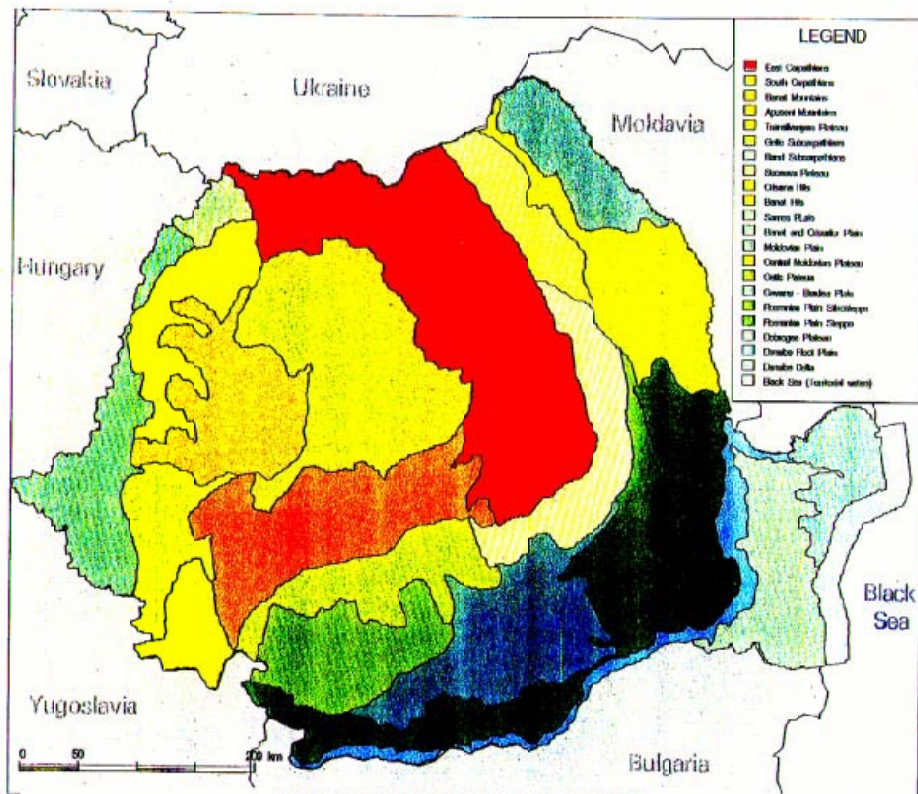
Creation and/or Revision of Laws

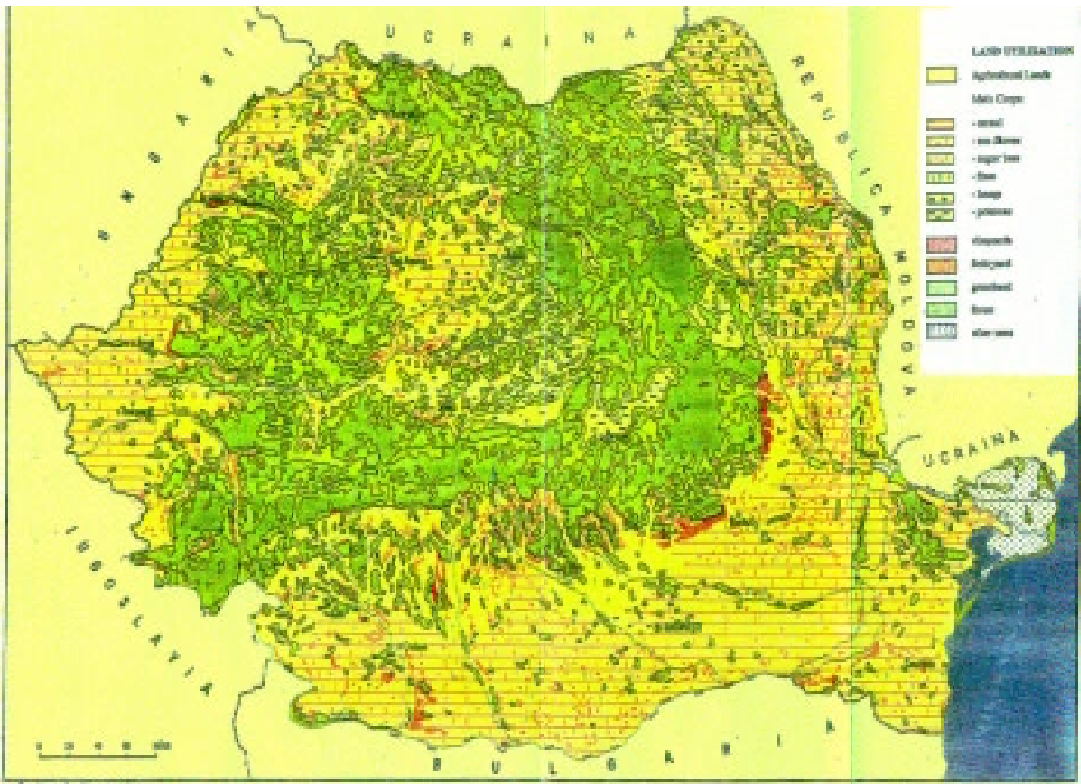
It is necessary to urgently revise laws covering protected areas, particular ecosystems, hunting and fishing, protection of flora and fauna, bees protection and keeping and general biodiversity protection and sustainable use of its components.

Capacity Building

In order to ensure the implementation of actions designed for the conservation of biological diversity and sustainable use of its components it is necessary to enhance departments responsible for biodiversity in both national and local organisations and in the agencies which govern issues which affect biodiversity. The responsible personnel must be trained to carry out their designated tasks and thereby strengthen the capacity for biodiversity conservation in Romania.







Carta de utilizarea terenurilor