

COST Action E27

Protected Forest Areas in Europe – Analysis and Harmonisation (PROFOR)

Country Report - the Former Yugoslav Republic of Macedonia

Working Group 1 – Task 1.1.

Description of the historical background that has led to the development of particular national Protected Forest Area frameworks

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Abstract. The Former Yugoslav Republic of Macedonia has a total of 7.16 % of the country area (involving 69 Protected Forest Areas (PFA)) under some form of protection. According to IUCN, the current 5 types of PFA are strict nature reserves, National Parks, natural monuments, landscapes with special natural features, and localities with specific plant and animal species outside nature reserves. They were not selected using standardised scientific criteria. The major responsible organisation for selecting, designating, and enforcing the protection of PFAs is the Ministry of Environment and Physical Planning. There have been no official forest inventories since 1979 due to the lack of an official forest cadastre. Yet, unofficial forest surveys are conducted and contained within the forest management plans and within the country's Physical Plan. There are efforts for enlargement of the protected area system up to circa 18 % of the country area, especially with the new pending Law on Nature Protection by applying standardised criteria.

Any views or opinions expressed in this document are those of the authors and not necessarily those of any official body within the signatory states.

Keywords: PFA, conservation, forest management plans, natural rarity, protection, selection criteria

1. Introduction

The Former Yugoslav Republic of Macedonia (FYROM) is situated in the central part of the Balkan Peninsula and has a very favourable geographic position. It extends between 40°50' and 42°20' north latitude, and between 20°27'30" and 23°05' east longitude.

The Republic was established in 1991 and before that time it was a republic within the Socialist Federative Republic of Yugoslavia. It covers an area of 25,713 km² and has a population of 1,945,932 inha-

bitants (according to the 1994 census), with a population density of approximately 81 persons/km².

The country borders Albania in the west, Greece in the south, Bulgaria in the east and Serbia and Montenegro in the north. The total length of the border is 849 km, of which the western border is 191 km, the southern, 262 km, the eastern, 165 km and the northern, 231 km in length. The northern and southern borders are roughly parallel, while the western and eastern borders form opposing convex arcs. The total area of the country is 25,713 km².

The country is characterised by very complex geology and diverse and developed relief, and conse-

quently a great variation of soil types. This is the main reason, together with hydrological aspects (including three natural lakes) and different climatic influences, for the rich biodiversity that is supported in this relatively small territory. Human influences throughout the millennia should not be neglected.

Due to specific natural and geographic characteristics, there are two main types of climate: Mediterranean and continental. In the highlands and the mountainous areas there is also a mountainous climate characterised by short, cool summers and considerably cold and moderately wet winters, where precipitation is mainly in the form of snow. The average annual temperature is 11.3° C.

From a climatic and phytocoenological point of view, the following climate-zonal - altitude belts are distinguished: sub-Mediterranean climate, sub-continental climate, moderate sub-continental belt, cold sub-continental belt, foothill belt, forest belt, sub-alpine, and alpine belt.

The country has a wide range of soil types: Automorphous (*undeveloped* – rocky soil, serozem on loose substratum, aeolian sand and colluvial soil; *humus-accumulative* – limestone-dolomitic mould, rendzina, humic-silicate soil, chernozem, and smolnica (vertisol); *cambic* – eutric brown soil, acid brown soil, brown soil over limestone and dolomite, and red soil; *eluvial-illuvial* – luvic soil and brown podzolic soil; *anthropogenic* – regolithic soil, garden soil and landfill soil); Hydromorphic (*undeveloped* – alluvial soil; *pseudogley* – pseudogley; *meadow* – meadow soil; *gley* – pseudogley-gley, black hill soil, gley soil and peat-gley soil; *peat* – high peat, intermediate peat and low peat; *anthropogenic* – regolithic peat soil, rice soil and irrigated soil); Halomorphic (*acute saline soils* – solonchak; *solonetz* – solonetz); Subaquatic (*undeveloped* – protopedon; *developed* – “gitja,” “daj” and sapropel).

Forests cover 950,594 ha of the country, representing 37 % of its land area. By growth form, high forests constitute less than 30 % of the total forest cover, while low forests account for 70 %.

As a result of the Former Yugoslav Republic of Macedonia's location on a geographic crossroads, there is wide diversity of dendroflora, with over 300 species present of which 16 % are Balkan endemics. Forests comprise pure broadleaf stands, mostly oak and beech, (550,000 ha), mixed broadleaf stands (288,000), pure conifers (mostly Austrian Pine and Scots Pine (83,000), mixed broadleaf/coniferous stands (47,000 ha) and mixed coniferous stands (8,000 ha).

Approximately 40 % of the country is covered by forest reserves (1 million ha), agricultural lands make up roughly 50 %, although not all of this is actually covered by “forests”. Although a large percentage of the land appears to be under forest cover, less than 29 % of forest reserves are actually under relatively solid forest coverage. Low dendriform and degraded forests occupy the remaining 71 % of forest area.

Although privatisation of forest resources is taking place and nearly complete (to revert forest resources to the state of ownership in 1939), privately owned forests occupy no more than 15 % (125,872 ha) of the entire forest stock of the country. The majority of the forest resources remain in state ownership.

2. History of Protected Forests in the Former Yugoslav Republic of Macedonia

2.1. General Information on Forests and Forestry in the Former Yugoslav Republic of Macedonia

- Historical data about forestry in the country's territory are very scarce. In the course of the 3rd and 4th centuries the territory abounded in forests, which were mainly in the basins of the major rivers: Vardar, Crna Reka and Struma.
- The coming of Turks in the Balkan Peninsula marks the continuation of the already excessive exploitation of forests in the vicinity of settlements and water ways. Consequently, degraded types of forest vegetation and bare mountainous terrain were formed, and have persisted until the present day. The numerous livestock needed greater areas of pastures as well as lower forests. This was the reason why the upper altitudinal limit of forest vegetation was lowered, while the lower limit was degraded to a large extent. In addition, the forest fund greatly suffered due to recurrent wars, invasions, forest fires and irresponsible wood exploitation.
- In summary, the country's forest cover was progressively reduced for centuries. After 1880, the Ottoman Empire introduced a forest service but modernised its organisation as late as in 1908. Despite that, its administration did not take any measures for promotion of forest management.

- Following the Balkan Wars (1912-1914) the first forest map was produced and the first forestation activities commenced.
 - The first foundations of a rather modern forest administration in the country were laid after World War I (1914-1918). Work was initiated in respect of establishment of the forest fund state, mapping and forest description. During 1913-1914, 12 forest sections were established on the territory of the country. In 1919 they were grown into district forest administrations within the Forest Inspectorate in Skopje. In 1922 the Inspectorate became the Forest Directorate. In 1937 the Directorate managed a forest area of 418,744 ha and consisted of 14 forest administrations.
 - In 1945 the state of forests was very unfavourable due to the inconsiderable fund of preserved forest (470,000 ha), and 111,000 ha of degraded forest. Forest utilisation in the Republic became better organised from 1945. In order to improve the poor forest fund, massive actions for afforestation, on one hand, and conservation of the existing forests, on the other, were launched. For instance, from 1945 until the end of 1964, 38,232 ha of land were afforested.
 - In 1944 the Experimental Institute within the Ministry of Agriculture and Forestry was founded to undertake research into problems of restoration of forest vegetation on degraded terrains. In 1950 The Institute became independent.
 - In 1947 the Agriculture and Forestry Faculty was established in Skopje. From 1970 until 1976, a Forestry and Wood Industry Institute functioned within this Faculty. In 1975 the Forestry Faculty became an independent institution, while in 1976 it integrated the Forest Institute and the Experimental Station from Skopje into a sole organisation in the country dealing with research, education and practical application in the field of forestry.
 - In 1961 the Basic Law on Forests was adopted.
 - In 1964 wood-cutting was executed through 27 forest organisations, and from 1966 until 1975 its average amounted to 710,000 m³.
 - In 1970 the Republic's Assembly adopted a programme of amelioration of bare mountain terrains and a law on establishment of a republic fund for forestation of 5,000 ha of bare mountain terrains.
 - In 1991, the Former Yugoslav Republic of Macedonia gained its independence. In 1997 the *Law on Forests* was enacted.
 - In 1999 the Ministry of Environment and Physical Planning (MoEPP), having previously been part of the Ministry of Urban Planning and Construction, was established with the responsibilities of monitoring, planning, protection and controlling.
- ## 2.2. Nature Conservation and Protected Areas, mainly Forest
- In 1949 the Central Institute of Cultural Monuments and Natural Rarities Protection was founded on the basis of the law dated 1948.
 - With a special law Pelister was declared a National Park in 1948.
 - With a special law Galicica was declared a National Park in 1958.
 - In 1960, the Republic's Assembly adopted the *Law on Natural Rarities Protection*. At the time, 120 objects of nature were registered, and from 1965 until 1973 fifty objects were protected. This Law regulated the protection of air, water, land, plants and animals.
 - Mavrovo was declared a National Park in 1965.
 - At the beginning, the Natural Rarities Protection Service was a department within the Republic Institute of Cultural Monuments Protection. In 1981 this department grew into an independent Republic Institute of Natural Rarities Protection. Its mission was to preserve the authentic condition of natural rarities, prevent all activities that present a danger to them, supervise National Parks, etc.
 - With the *Law on Protection of National Parks* from 1980, National Parks were included in the category of institutions from the field of culture, and these were Galicica, Mavrovo and Pelister.
 - In 1996, the *Law on Environment and Nature Protection and Promotion* was passed by Parliament in order to regulate basic issues related to environmental protection.
 - The *National Committee for National Biodiversity Strategy* was founded in 2000 within the Ministry of Environment and Physical Planning, as a state obligation arising from the *Convention on Biological Diversity* (Rio de Janeiro, 1992) ratified by law (Official Gazette of the Republic of Macedonia 54/97) and implemented in the country in 1998.

3. Current State

3.1. Main Types of PFA and Responsible Organisations and Procedures

3.1.1. Protected Forest Areas

The Former Yugoslav Republic of Macedonia has a total of 7.16 % of the country under some form of protection. This is below the internationally strived for 12 %. However, there are some efforts for enlargement of the system of protected areas (Draft National Physical Plan; recently published National Biodiversity Strategy and Action Plan). Table 1 represents the categorisation of these protected areas according to IUCN.

The Strict Nature Reserves (SNR) are:

- SNR Ezerani, on Prespa Lake, with 2,080 ha, and
- SNR Tikves, in the gorge of Crna Reka with 10,650 ha

Within the Strict Nature Reserves as a whole, 42 floral species are protected.

Floral diversity within the SPR Ezerani is represented mainly by wetland and grassland vegetation, while within SPR Tikves it is represented by hill and mountainous trees and shrubs. Natural monuments abound in aquatic flora species (in water ecosystems), grassland, wetland, hill and mountain flora, and fungi.

Localities with specific plant and animal species primarily contain protected tree species [predominantly pine, fir, yew, juniper, oak, beech, birch, wild chestnut, plane tree (*Platanus orientalis*), etc.].

Table 1:
Protected Areas in Former Yugoslav Republic of Macedonia

Name of PFA	Motivation for protection					Number of areas	Total size of areas (ha)	Coverage of the country (%)
	Habitat conservation	Species conservation	Naturalness	Biocultural heritage	Landscape protection			
Strict nature reserve	*	*	*	*		2	12,730	0.49
National Park	*		*	*		3	108,338	4.20
Natural monuments	*	*				47	58,084	2.25
Landscape with special natural features	*		*		*	3	2,338	0.09
Localities with specific plant and animal species outside nature reserves		*				14	2,647	0.10
Total						69	184,137	7.16

- At present, the *Law on Natural Rarities Protection* (Official Gazette of SRM No 41/73) is in force in the Former Yugoslav Republic of Macedonia until the adoption of the pending new *Law on Nature Protection*, which is in parliamentary procedure. According to the current legislation, protected areas in the Former Yugoslav Republic of Macedonia are given the legal status of ‘natural rarities’.¹
- The largest area is covered by National Parks (NP) and these are:
 - NP Mavrovo with 73,088 ha
 - NP Galicica with 22,750 ha, and
 - NP Pelister with 12,500 ha.
- With the support and assistance provided by the Council of Europe Secretariat, the Ministry of Environment and Physical Planning of the Former Yugoslav Republic of Macedonia has set up the Emerald Network in a pilot project as important preparatory work for future designation of Natura 2000 sites for when the country joins the European Union. Galicica NP has been proposed as a Potential Area of Special Conservation Interest.

3.1.2. Key Legislative Basis on Forest Protection

The basic issues in connection with environmental protection are regulated with the *Law on Environment and Nature Protection and Promotion* dated 1996. The original text has been amended and supplemented (51/00; 96/00; 45/02).

The National Parks are dominated by mountain trees and shrubs, and a total of 83 floral species are protected within them.

¹ In some laws, though, such as the Law on Environment and Nature Protection and Promotion (1996), the generic term for protected areas is ‘special natural wealth’. There is an apparent inconsistency of terms in the relevant national regulations as well as deviation from international nomenclatural standards for identification of protected areas.

The major national laws pertaining to forest protection are the following:

- *The Constitution of the Former Yugoslav Republic of Macedonia*
- *Draft-Law on Nature Protection*, pending
- *Law on Natural Rarities Protection* (No 41/73; modifications: 42/76, 10/90, 62/93)
- *Law on Protection of National Parks* (Official Gazette of SRM 33/80; modifications: 10/90, 62/93)
- *Law on Forests* (Official Gazette of SRM 47/97; modifications: 7/00)
- *Law on Plant Protection* (Official Gazette of SRM 25/98; modifications: 6/00)
- *Regulations on the Use of Other Forest Species* (Official Gazette of SRM 13/00)
- *Law on Hunting* (20/96)

Other relevant documents:

- *National Environmental Action Plan*, Ministry of Environment and Physical Planning, 1997. This strategic document is oriented towards environment improvement and conservation, biodiversity protection, and sustainable use of natural resources.
- *Physical Plan of the Former Yugoslav Republic of Macedonia*, Physical Planning Management, 1998.

Ratified pertinent conventions:

- *Convention on Biological Diversity (Rio)* Ratified by RM in 1997. In effect since 1998.
- *Convention on the Conservation of European Wildlife and Natural Habitats*. Ratified in 1997. In effect since April 1999.
- *Convention for Protection of World Cultural and Natural Heritage*. Ratified by SFRJ in 1974.
- *Convention on International Trade with Threatened Wild Plant or Animal Species (CITES)*, ratified by RM in 1999.

3.1.2.1 Law on Natural Rarities Protection

The protected areas in the *Law on Natural Rarities Protection* (No 41/73; modifications: 42/76, 10/90, 62/93), which is at present in effect in the Republic, are as follows:

Strict Nature Reserves are tightly defined area where the natural authenticity of biocenosis (flora and fauna habitats) has been preserved.

National Parks are areas of preserved authentic nature, which, due to their natural beauty and value of the flora and fauna, the geological, geomorphological, hydrological and other features, the historic,

scientific, cultural, educational and other significance, as well as their wealth of general interest, are to be under special protection of the community. The National Parks are the highest protection group.

Natural Monuments are examples of living or abiotic nature, that owing to their specific characteristics possesses particular scientific, cultural, educational, aesthetic and other value.

Landscapes with special natural features are areas distinguished by their panoramic view and imposing natural beauty; they are formed by nature and serve as an air spas, holiday resorts, park-forests or have other similar purposes.

Localities with specific plant and animal species outside nature reserve are areas whose biotopes contain threatened species of flora and fauna. They can also be localities comprising endemic species.

3.1.2.2 Draft-Law on Natural Protection

Within the pending *Draft Law on Nature Protection*, which is in parliamentary procedure, the following categories will be recognised:

Strict Nature Reserves shall be areas which due to their important or distinctive ecosystems, geological or physical-geographic features and/or species as well as preserved authentic wildlife have important natural heritage, primarily for the purpose of conducting scientific research or conservation monitoring.

National Parks shall be large, mainly unaltered areas of land or water with particular multiple natural values, comprising one or more preserved or little-altered ecosystems, and are primarily intended for conservation of the original natural, cultural or religious heritage. The National Parks have academic research, cultural, educational, and touristic functions.

Natural Monuments shall be examples of nature with one or more natural features and specific threatened or rare landmarks, qualities or forms, and have special academic, cultural, educational, religious, aesthetic, and/or touristic functions or values.

Landscape Parks shall be areas possessing one or more original, rare and distinctive nature components (floral, fungal, and fauna species and associations, relief forms, hydrological values, etc.).

Protected Landscapes shall be areas where in time the interaction of humans and nature have created a landscape with distinctive characteristics and aesthetic, ecological, cultural, historic or ethnographic significance typical only of that area, and which possess substantial biological diversity.

Multi-purpose Areas shall be areas that generally occupy a relatively large territory of land and/or water, which have open-waters, forests or meadows, and may be used for hunting, fishing or tourism or for breeding of game. They may be anthropologically altered and include settlements.

3.1.3 Responsible Organisations and Management

The Ministry of Environment and Physical Planning is responsible for physical planning; inspection, supervision, and monitoring of the environmental condition; protection of biodiversity, geodiversity, National Parks and protected areas. The Ministry of Environment and Physical Planning is not represented on local and regional levels, but has project offices for implementation of certain projects on a local level. With the new pending Law of Nature Protection, the Ministry of Environment and Physical Planning will manage protected areas (National Parks will be supervised). This will rationalise their management in a single organisation with a mandate for overall environmental management for the country.

Currently, the National Parks are each managed more or less independently as “enterprises” (Administration Office of the NP “Mavrovo”, Gostivar, Administration Office of the NP “Pelister”, Bitola, Administration Office of the NP “Galichica”, Ohrid) in a somewhat non-profit format. Exploitation of

resources is allowed in the park and it is the main source of revenue generation for management. Timber harvest revenues are the main source of this funding and it may not be appropriate for sustainable protected area management. Other forms or revenue generation, more traditional for protected areas, such as concession fees for hotels (or ski resorts in the case of two of the parks) or entry fees are currently not pursued.

Management plans only exist for the National Parks in the Former Yugoslav Republic of Macedonia. However, these are restricted plans, which primarily amount to general directions on timber harvesting, hunting and related staffing issues. In general, the National Parks are run more as very effective forestry concessions rather than as National Parks in the sense usually understood. Table 2 summarises information on organisations and their responsibilities.

3.2. Selection Criteria and Representativity

The existing PFAs in the Former Yugoslav Republic of Macedonia (Table 1) were not selected using standardised scientific criteria, and no such criteria are currently in use. With the pending new Law on Nature Protection, specific scientific standardised criteria for selection of PFAs in the Republic of Former Yugoslav Republic of Macedonia will be

Name of organisation	Responsibility for PFAs	Web link
Administration		
Ministry of Environment and Physical Planning	Selection, management and monitoring all five categories of PFAs in the country (Table 1)	http://www.moe.gov.mk
Main Office for National Parks and Hunting Reserves	Management of National Parks and hunting reserves	-
Administration Offices of NPs	Management of National Parks	-
Administration Offices of Strict Nature Reserves	Management of strict nature reserves	-
Research Centres		
Former Yugoslav Republic of Macedonian Academy of Sciences and Arts	Research institution providing advice on selection, management, and scientific monitoring of PFAs	www.manu.edu.mk
Faculty of Forestry, Ss Cyril and Methodius University	Research institution providing advice on selection, management, and scientific monitoring of PFAs	www.sf.ukim.edu.mk
Faculty of Natural Science, Ss Cyril and Methodius University	Research institution providing advice on selection, management, and scientific monitoring of PFAs	www.pmf.ukim.edu.mk
Non-Governmental Organisations		
Former Yugoslav Republic of Macedonian Ecological Society	Scientific and expert NGO providing advice on biodiversity and nature conservation	

adopted. These criteria are part of the Physical Plan of the Republic – a departmental study for natural heritage protection, dated July, 1999, and they are stipulated in Article 3 of the Law on Natural Rarities Protection. The evaluation of natural heritage consists of 4 phases as follows: defining the topic groups, collection of proposals, and evaluation of proposals (scientific value, uniqueness or rarity, significance, ecological value, recreation value and endangerment, classification into protection groups). The criteria are as follows:

- *Criterion 1 - scientific value:* the object or the area is suitable or serves for scientific research into the natural condition or as an object of study.
- *Criterion 2 - uniqueness or rarity:* the object is a rare natural phenomenon, unique form, group, or species, or of exceptional old age.
- *Criterion 3 - significance:* the sample or the species is frequent but only in a restricted area.
- *Criterion 4 - ecological value:* the object is a rare ecosystem or a refugium of endangered animal or plant species.
- *Criterion 5 - recreation value:* the area is meant for recreation.
- *Criterion 6 - endangerment:* certain species disappear due to a change in the environment although currently they are not rare yet.

3.3. Inventories and Monitoring

- There have been no official forest inventories in the Former Yugoslav Republic of Macedonia since 1979, the reason being the lack of an official forest cadastre. Consequently, unofficial forest surveys are conducted and contained within the forest management plans as well as within the Physical Plan of FYROM (see Table 3). Throughout the country

Name of inventory	Forest Survey
Description	Dendrometric data (forest types, age, degree of degradation, etc.)
Reference area	Countrywide; all non-agricultural land
Treatments of PFAs	No
Spatial data	Systematic inventory on permanent plots (usually 250 x 250m)
Responsible organisation	Ministry of Agriculture, Forestry and Water Resource Management
First survey	After WW I
Frequency of surveys	Not regular
Web link	-

there are 184 forest management units, and 184 forest management plans respectively. The plans are valid for ten-years, after which they are revised. They are approved by the Minister of Agriculture, Forestry and Water-Resource Management.

In addition, detailed inventories are conducted for PFAs, such as inventories of plants, trees, fungi, birds, bats, etc., but these occur periodically, through specially designed research projects. These inventories provide the essential information for generating the management plans of PFAs.

3.4. Landscape, Spatial and Other Considerations

- According to the Physical Plan of the Former Yugoslav Republic of Macedonia, forests, forest crops and intensive plantations are present on 934,128 ha or 36.7 % of the total area of the Country.
- The status of forests in the Republic has generally been specified by the Constitution. Forests have been defined as public goods and have been placed under special care, by law.
- According to the Ministry of Agriculture, Forestry and Water-Resource Management, the area covered by the plans is 998,054 ha or 92 % of the total area under forests and forest land. By quality, forests in FYROM consist of 262,790 ha of high forests i.e. 29 %, and 642,863 ha of low dendriform i.e. 71 % of the total forest area.
- The forest stock in the Republic is divided into 5 types:
 - Pure deciduous forest (beech, oak-all kinds, other hard deciduous trees, poplar, other soft deciduous trees), covering a surface area of 541,730 ha
 - Pure conifer forest (juniper, fir, black pine, white pine, and other conifer trees), covering a surface area of 81,673 ha
 - Mixed deciduous forest (beech, oak-other deciduous, beech-other deciduous, oak-other deciduous, other deciduous), covering a surface area of 277,146 ha
 - Mixed conifer forest (juniper tree-fir, black-white pine tree, other conifer trees), covering a surface area of 7,656 ha
 - Mixed forest – deciduous / coniferous (beech-juniper tree-fir, black pine tree, white pine, other deciduous trees and conifers), covering a surface area of 57,445 ha.

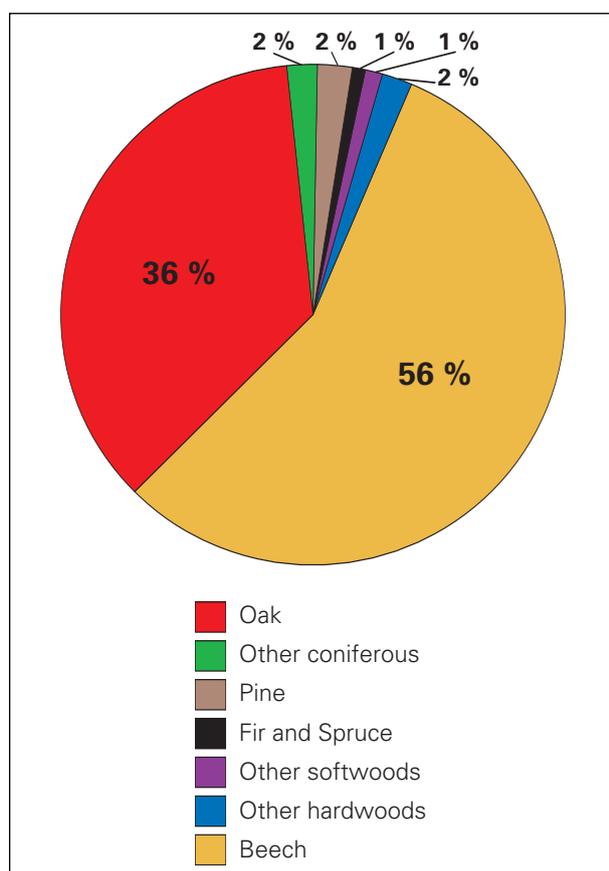
Table 4 presents the types of forest in FYROM according to the criteria of purpose and ownership.

Table 4:
Forest types in the Former Yugoslav Republic of Macedonia according to the purpose and ownership. Source: State of Environment Report 2000, Ministry of Environment and Physical Planning

Forest types according to the purpose and ownership		Area	
		ha	%
Economic forest	Private	859,427	82.90
	Public	106,427	10.24
Forest in National Parks		43,589	4.20
Protected forest		17,617	1.70
Recreational resort		1,101	0.10
Other forest with specific purpose		8,897	0.86

- One-third of the forests in FYROM are considered to be suitable as a source of raw material for the timber industry. Over the course of the last 10 years, the average gross volume of timber harvested has totalled 1,033,000 m³, of which 76 % (786,000 m³) originated from state-owned forests and 24 % (247,000 m³) from private ones.

Figure 1:
Composition of timber harvest in the Former Yugoslav Republic of Macedonia. Source: Ministry of Agriculture, Forestry, and Water-Resource Management



- The Republic's forests are managed by the Public Enterprise of Forestry. It manages forests that are both in state and private ownership, in compliance with the Law on Forests. Most of the project activities of the Ministry of Agriculture, Forestry and Water Resources Management are executed by this public enterprise. In cooperation with the diagnosis office seated at the Forestry Faculty in Skopje, the Public Enterprise of Forestry follows forest health status.
 - Land use within the Former Yugoslav Republic of Macedonia has been categorised on the basis of productive purposes (agriculture and forestry) and non-productive purposes (water and watercourses, infrastructure, settlements and non-arable land). Forestland includes 22,000 ha of non-productive areas (rocky terrain). As a result of the measures taken for forest maintenance and artificial reforestation, today the forests have been rehabilitated, with a large part of the scrublands converted into low forests (woodlands), and low forests into high forests. Unfortunately, seedlings of white and black pine have been used in the reforestation process rather than naturally occurring species. Of special note is the fact that 250,000 ha of forests and forest lands are currently almost devoid of vegetative cover (both inside and outside the main forest canopy). Of these, 0.4 % is under sparse cover. These are areas suitable for replanting or for allowing natural reforestation to occur.
 - No protected area system plan or network exists. As in many other countries, the highlands have been set aside primarily as protected areas. Similarly, these have been established less for reasons of biodiversity conservation and more for water resources, for scenic, forest, or other reasons. Since there is a large variation in elevation within these areas and are located in the more diverse western region of the country, they indeed tend to be areas of high biodiversity concentration. Lowland areas with other forms of biodiversity, i.e. wetlands and Mediterranean forest and other ecosystems are severely under-represented (if at all) in the existing protected areas. The Bio-corridor network was never established.
- Two aquatic ecosystems have been nominated in the Former Yugoslav Republic of Macedonia for the international lists of world natural heritage. These are the Ramsar Site Prespa lake, with an area of 18,920 ha (7.97 %), included in the World Ramsar List in 1995 and Ohrid natural, cultural and historical area with an area of 38,000 ha (16.01 %),

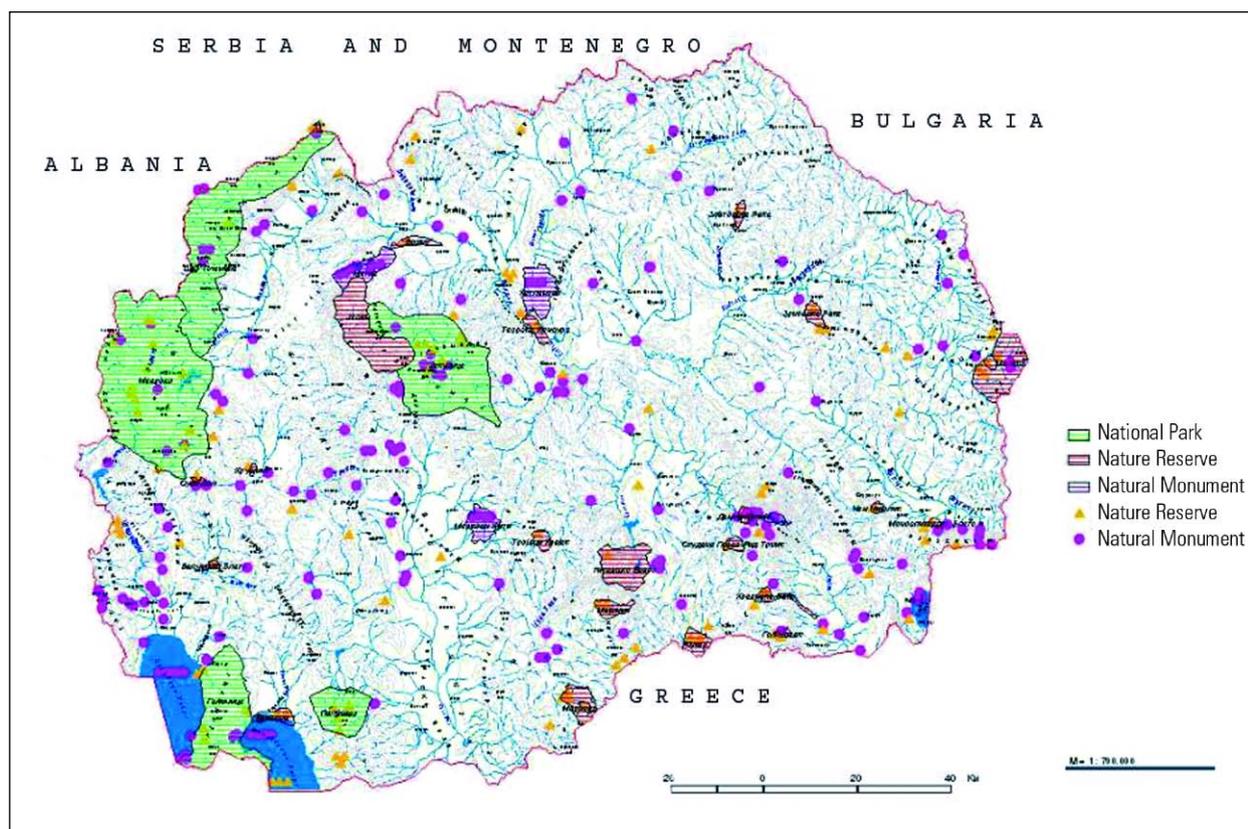


Figure 2:
Natural Heritage in the Former Yugoslav Republic of Macedonia according to the Physical Plan of RM.
Source: Ministry of Environment and Physical Planning

placed on the List of the World Heritage (1981). They are characterised by exceptionally rich flora and fauna elements and habitats, in particular as biological centres of genetic resources. With the increased designation of Lake Ohrid and Lake Prespa with a higher level of protection status, the biological diversity of these ecosystems is therefore represented within the broader (though undefined) protected area network.

3.5. Future Developments

There is a clear policy to increase the proportion of Protected Forest Areas in the Former Yugoslav Republic of Macedonia (see Table 5). The pivotal point in this respect is the forthcoming Law on Nature Protection and its practical implementation. For a detailed review of the projected natural heritage protection until the year 2020, refer to Table 6.

According to official data based on scientific research, instead of the current 69 protected areas covering 7.16 % of the total country area, there

should be approximately 109 protected areas of different categories covering circa 18 % of land in the country. It is recommended that an additional 39 natural properties be included in the system of protected areas. These are the following:

- 2 National Parks
- 9 strict nature reserves
- 14 scientific research nature reserves
- 14 special nature reserves

In respect of geographic location, both the currently protected natural properties and those yet to be protected are distributed throughout the Former Yugoslav Republic of Macedonia. Most of them are located in the western part of the country, whereby a number of them are present in the tourist regions.

The comparison of data on the numbers and types of currently protected natural properties with those that deserve to be placed under protection might be problematic given that the existing system of classification and categorisation of natural rarities (according to the Law on Natural Rarities Protection) has not been harmonised with international standards.

*Table 5:
History of Natural Heritage and Projection for the Future*

Year of Protection	Protected Areas	Area in ha	Percentage
1948-1960	11	131,599	5.11
1961-1998	58	52,538	2.04
Total	69	184,137	7.16
Projection for the period 1999-2020	194	112,776	4.38
Total	263	296,963	11.54

National Report on Biodiversity Conservation in Protected Areas in RM, published in UNEP/ROE Documents, Geneva, Switzerland

National Reports (1-2) on the Implementation of Bonn Convention in RM, published in CMS/UNEP Documents, Bonn, Germany

National Reports (1-3) on the Implementation of London Agreement in RM, published in EUROBATS/UNEP Documents, Bonn, Germany

National Reports (1-3) on the Implementation of Ramsar Convention in RM, published in IRB Documents, Gland, Switzerland

Biodiversity Strategy and Action Plan of the Republic of Former Yugoslav Republic of Macedonia. Ministry of Environment and Physical Planning of RM, Skopje, 2003, pp. 30

4. Tabulated Lists of National PFAs and Terminology

*Table 6:
Projection of natural heritage protection until the year 2020*

Protection group	Protected	Area in ha	%	Proposed for protection	Area in ha	%	Total No of Objects	Area in ha	%
National Park	3	108,388	4.215	2	79,858	3.105	5	188,246	7.321
Strict nature reserve	2	12,730	0.495	6	952	0.037	8	13,682	0.532
Scientific research nature reserve	-	-	-	38	11,836	0.460	38	11,836	0.460
Landscape with special natural features	3	2,338	0.090	3	11,628	0.452	6	13,966	0.543
Characteristic landscapes	-	-	-	1	200	0.007	1	200	0.007
Special nature reserves	-	-	-	26	5,155	0.200	26	5,155	0.200
Localities with specific plant and animal species outside nature reserves	14	2,647	0.102	-	-	-	14	2,647	0.102
Nature monument	47	58,084	2.258	118	3,147	0.122	165	61,231	2.381
Total	69	184,137	7.16	194	112,776	4.38	263	296,963	11.546

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