

MANAGEMENT OF PROTECTED NATURAL AREAS CASE STUDY: BRAILA COUNTY

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Abstract: Biodiversity is a huge variety of ecosystems, species and genes, which represent the natural capital, and provides services supporting the economy. The biodiversity values make up the natural heritage that must be used by the present generations without jeopardizing the chance of the next generations to enjoy the same living conditions.

The protected natural areas represent the most important method to preserve biodiversity and to provide development patterns in harmony with nature, in the context of the fast economic development in the last decades.

Keywords: biodiversity, protected natural areas, sustainable development

1. INTRODUCTION

Biodiversity represents the primordial condition of the human civilization existence and provides the support system of life and of the socio-economic systems development.

From the conceptual point of view, biodiversity has its intrinsic value, to which ecological, genetic, economic, social, scientific, educational, cultural, aesthetic, recreational and last but not least, ethical values are also added.

Biodiversity has an important role in the life of any society, being reflected in the society culture and spirituality - folklore, art, architecture, literature, traditions and practices in land and resources utilization.

The aesthetic value of biodiversity is a basic human necessity, the natural and cultural landscapes being the basis of the tourism and leisure sector development.

But maybe the most important value of biodiversity is of ethical nature, the human society having the obligation to ensure the preservation and sustainable utilization of all biodiversity components.

The present study intends to make an assessment of Brăila county biodiversity and of the management of protected natural areas, of its preservation state, of the anthropic activities that have led or could lead to its degradation.

2. STATE OF KNOWLEDGE

The biodiversity concept was introduced by Walter G. Rosen² in the year 1986, coming into prominence on the occasion of the UN Conference for Environment and Development from Rio de Janeiro in 1992. Two years later, Harper, J.L. and Hawkworth,

² Within the *National Forum on BioDiversity*, organized by the U.S. National Academy for Sciences, Washington D.C. 21-24 September 1986

D.L., (1994) stated that “biodiversity represents in fact the biological diversity”, which was defined by them by “including two kin concepts: genetic diversity and ecological diversity”.

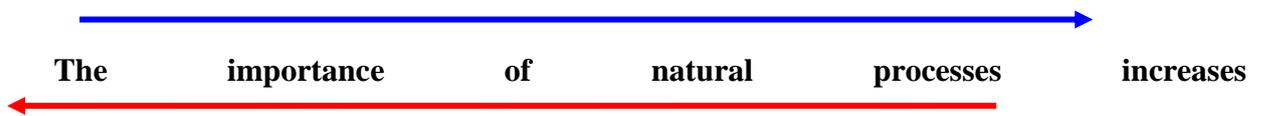
Leveque. C. and Mounoulou, J.C., (2001) considered that biodiversity “must refer only to the relations that regard the connection between man and nature, while the biological diversity should also refer to the evaluation and inventory of species”. Most specialists consider that biodiversity means in a way “everything” (Cogălniceanu, D., 1999).

If biodiversity is everything, i.e. everything that composes it, ensuring the environmental services and the resources without which man could not exist anymore, biodiversity preservation represents the basic condition for maintaining life on Earth. Biodiversity conservation can be mainly achieved in two ways: in-situ and ex-situ (Fig.1).

Figure 1. Biodiversity management mechanisms

In-situ		Ex-situ	
Ecosystem conservation	Species conservation	Living organisms collections	Gene banks
Protected areas (national parks, biosphere reserves, natural parks, natural monuments Marine sanctuaries	Sanctuaries for protected species and protected areas In-situ gene banks Hunting reserves Seed reserves	Zoological gardens Botanical gardens In captivity reproduction programs	Pollen and seed banks Genetic material banks Microbes cultures Tissue cultures

Man’s intervention increases



Source: Cogălniceanu, D., (1999), *Management of the natural capital*, Ars Docendi Publishing House, Bucharest

The in-situ conservation presupposes:

- ecosystem conservation by establishing a system of protected areas or zones needing special conservation measures, in parallel with the creation of a proper management system;
- species conservation within the natural or semi-natural habitats or ecosystems.

The ex-situ conservation consists of:

- maintenance and propagation of living organisms in zoological and botanical gardens;
- maintenance of seeds, embryos, genetic material, micro-organisms by freezing.

The study of biodiversity was carried out in several stages. While in the late 1960s only studies at local level were conducted (the Red list species – endangered, endemic, rare species), after 1990 the studies were characterized by a global perspective on biodiversity.

The most important event was the Summit in Rio de Janeiro in the year 1992, when the bases of sustainable development principle were laid, and a number of 153 states, including the European Union, signed up the UN Biological Diversity Convention (BDC), which was enforced on December 29, 1993. In early 2010, BDC was ratified by 193 parties and nowadays represents the most important international instrument in the coordination of biodiversity policies and strategies at global level. Romania ratified BDC by Law no.58/1994.

The three BDC objectives³ are the following: conservation of biological diversity, sustainable use of the biological diversity components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. “The conservation and sustainable use of biodiversity in the natural capital structure is substantiated and instrumented within the protected areas network” (Vădineanu, A, 2004).

The protected areas represent the most important method to preserve biodiversity and to provide development patterns in harmony with nature, in the context of the accelerated economic development in the last decades. The International Union for the Conservation of Nature (IUCN) defines the protected area as being “a clearly-delimited geographical space, acknowledged, designated and administered on the basis of certain legal acts or through other efficient means, targeting the long-term conservation of nature, as well as of the environmental services and related cultural values”.

Natura 2000 represents the keystone of the EU policy in the field of biodiversity and it represents a network of protected natural areas designed in order to implement the directives: *Habitats* (Directive on the conservation of natural habitats, of wild flora and fauna 92/43/EC) and *Birds* (Directive on the conservation of wild birds 2009/147/EC). Thus, this network protects the natural habitats and the wild species of endangered plants and animals at EU level, consisting of the following categories of protected natural areas of community interest (Natura 2000 sites):

- *Special preservation areas* that preserves habitats and species of plants and animals, except for birds, in conformity with the Habitat Directive; they are declared on the basis of the recognition of the Sites of Community Interest by the European Commission;
- *Special avifaunistic protection areas* for the protection of all wild birds species, in conformity with the Birds Directive.

By joining the European Union, Romania has the obligation to include a certain percentage of its natural space into this network, so as to ensure the conservation of it, if the respective areas accommodate habitats and species of community interest.

In conformity with Art. 5, paragraph (1) from the *Emergency Ordinance. no. 57/2007 on the regime of the protected natural areas, the conservation of natural habitats, wild flora and fauna*, the categories of protected natural areas in Romania are the following:

- a) of national interest: national parks, natural monuments, nature reserves, natural parks;
- b) of international interest: wetlands of international importance, biosphere reserves;
- c) of Community interest or Natura 2000 sites: sites of community importance (SCIs), special preservation areas, special avifaunistic protection areas (SPAs);

³ Convenția Diversității Biologice (Convention of Biological Diversity), <http://www.cbd.int/>

d) of county or local interest: established only on the private/public area of the administrative territorial units.

3. RESULTS AND DISCUSSIONS

3.1. Biodiversity and the protected natural areas in Brăila county

In conformity with the Romanian legislation on the regime of protected natural areas, the protected natural areas in Brăila county are the following:

a) Protected natural areas of national interest: in Brăila county there are 3 protected natural areas of national interest: one natural park and two natural reservations, the total area of which is of 23828.86 ha and represents 5% of the area of the county (Table 1).

Table 1. The protected natural area of national interest in county Braila, in year 2012

Name	Category of protected area	Area at level of county - ha
Balta Mică a Brăilei	Natural Park	22989 ^{*)}
Lacul Jirlău Vișani	Natural Reservation	838.66
Pădurea Camnița	Natural Reservation	1.2

^{*)} In years 2006-2008, in conformity to Law 5/2000 the total area of Natural Park Balta Mică a Brăilei was of 17529 ha, in years 2009-2010 after an assessment made by the Office for Cadastre and real Estate Publicity Brăila the park area increased to 20460 ha, and in period 2011-2012, in conformity to GD 538/2011 area of PNBMB was established at 24123 ha, of which 22989 ha pertain to county Brăila, and the rest: 976 ha to county Ialomița and 158 ha to county Constanța.

Source: Annual report regarding the environmental state in county Brăila per year 2012, Agency for the Environmental Protection

b) Protected natural areas of international interest in county

In conformity with the Ramsar Convention through which the wetlands of international importance are protected as habitat for the aquatic birds, convention to which Romania is a signing party, in the year 2001 Balta Mică a Brăilei (the Small Brăila Swamp) was declared RAMSAR site (position 1074 on Ramsar list) under the name Insula Mică a Brăilei (the Small Island of Brăila), he has an area of 17586 ha and represents 3,7% of the area of the county. 207 species of birds were inventoried, representing half of the species of migratory birds characteristic for Romania, among which 169 are internationally protected species, through the *Conventions in Berne, Bonn and Ramsar*.

c) Protected natural areas of community interest

In conformity with *Government's Emergency Ordinance no. 57/2007 on the regime of protected natural areas, the preservation of natural habitats, of wild flora and fauna*, approved with modifications and completions by *Law no. 49/2011*, the protected natural areas

of community interest (Natura 2000 sites) are represented by the special avifaunistic protection areas (the sites of community importance) and the special preservation areas.

The goal of *the special avifaunistic protection areas* is to preserve, maintain and where appropriate, to bring back into a favourable conservation state the birds species and the specific habitats, designated for the protection of the wild migratory birds of community interest, in conformity with the Birds Directive. Thus, on the territory of Brăila county, 9 special avifaunistic protection areas have been delimited, totalling an area of 59788.37 ha, which represents 12.5% of the county area (Table 2).

Table 2. Special avifaunistic protection areas in Brăila county

Crt. no.	Name	Code	Area at county level (ha)
1.	Balta Albă-Amara-Jirlău	ROSPA0004	1213.8
2.	Balta Mică a Brăilei	ROSPA0005	24821.8
3.	Balta Tătaru	ROSPA0006	8583.6
4.	Dunărea Veche-Brațul Măcin	ROSPA0040	6228
5.	Ianca-Plopu-Sărat	ROSPA0048	1982.1
6.	Lunca Siretului Inferior	ROSPA0071	1824.6
7.	Măxineni	ROSPA0077	1504.3
8.	Berteștii de Sus – Gura Ialomiței	ROSPA0111	2962.7
9.	Valea Călmățuiului	ROSPA0145	10667.8

Source: Annual report regarding the environmental state in county Brăila per year 2012, Agency for the Environmental Protection

The sites of community importance represent those areas which significantly contribute to the maintaining or the restoration to a favourable preservation state of the natural habitats or the species of community interest and which could significantly contribute in this way to the existence of the “NATURA 2000” network and/or significantly contribute to maintaining the biological diversity. On the territory of Brăila county, sites of community importance have been declared, totaling an area of 43318.74 ha and representing 9% of the county area (Table 3).

Table 3. Sites of community importance in Brăila county

Crt.	Name	Code	Site area at county (ha)
1.	Balta Albă-Amara-Jirlău-Lacul Sărat	ROSCI0005	2835
2.	Balta Mică a Brăilei	ROSCI0006	20872
3.	Brațul Măcin	ROSCI0012	4503.4
4.	Lunca Buzăului	ROSCI0103	978.18

5.	Lunca Siretului Inferior	ROSCI0162	1755.67
6.	Valea Călmățuiului	ROSCI0259	8603.04
7.	Ianca - Plopu - Sărat - Comăneasca	ROSCI0305	3222
8.	Lacul Sărat - Brăila	ROSCI0307	377
9.	Sărăturile de la Gura Ialomiței - Mihai	ROSCI0389	172.45

Source: Annual report regarding the environmental state in county Brăila per year 2012, Agency for the Environmental Protection

d) Protected natural areas of county interest

By Brăila County Council Decision no. 20/1994 on the protected natural areas and the natural monuments on the territory of Brăila county, the following zones were declared as protected areas: Balta Mică a Brăilei, Lake Jirlău, Camnița and Viișoara Forests, as well as Popina Blasova. Subsequently, the first three obtained the protected natural area of national interest status, declared by Law 5/2000 for the approval of the national territory management plan, and Forest Viișoara and Popina Blasova have the status of protected natural areas of county interest at present, both of them represents 0,4% of the Braila county.

Forestry Reserve Viișoara has an area of 1897.8 ha, being located in the southern part of Brăila county. The forest is a relict of the oak tree forests that used to populate the sands on the right bank of the river Călmățui. Being irrationally cut for hundreds of years, the forest was naturally regenerated. The forest consists of oak and acacia trees, and the reason of obtaining the protection status was the very existence of these oak trees, a rare species in Brăila forests. For the quantity and quality of the wood, an area of 39.4 ha of it is also a seminologic reserve, mentioned in the “National catalogue of resources for forest reproduction materials in Romania”.

Popina Blasova is located in the north-eastern part of Insula Mare a Brăilei, near Lake Blasova and was declared natural monument due to its singularity in the relief of Brăila county, with a height of 45 m and an area of 2.3 ha. Due to the soil conditions generated by the mineralogical composition of the area, the vegetal cover on the northern flank includes two endemic species: the blue bell and the milfoil with yellow flowers.

In 2012 in Braila county there are 24 protected natural areas, out of which: 3 protected natural areas of national interest, 1 RAMSAR Site, 18 Natura 2000 sites (9 SPA and 9 SCI) and 2 protected natural areas of county interest. The total area of protected natural areas represents over 30% of the surface of Braila county.

Only 10 of the natural protected areas have regulations and management plans in various stages of elaboration and approval and were awarded joint custody.

Table 4. Protected natural areas awarded in custody

Crt No	Name	Category of protected area	Total area ha	The surface Braila county ha	Custody/administrator

1.	Balta Mică a Brăilei	Natural Parc	24123	22989	The Administration Natural Park Balta Brăilei
2.		RAMSAR Site	17596	17596	
3.		Natura 2000 -	25856	24821.8	
4.		Natura 2000 -	20872	20872	
5.	Pădurea Camnița	Natural ation	1.2	1.2	Brăila Forestry orate
6.	Dunărea Veche- Măcin	Natura 2000 –	18759	6228.05	CountyFfishermen's ation Athletes Galați
7.	Lunca Siretului r	Natura 2000 –	36492	1824.6	The Association for Conservation of ical Diversity
8.		Natura 2000 –	25081	1755.67	
9.	Brațul Măcin	Natura 2000 –		4503.4	County Fishermen's ation Athletes Galați
10.	Lunca Buzăului	Natura 2000 –	6987	978.18	The Ecological sity of Bucharest

Source: Annual report regarding the environmental state in county Brăila per year 2012, Agency for the Environmental Protection

The rest of the 14 protected natural areas do not have any regulations and management plans.

3.2. The situation of terrestrial and aquatic ecosystems

The county Brăila has a great variety of terrestrial and aquatic ecosystems (specific floodplain forests, meadows, swamps and lakes, canals with alluvial banks), characteristic for the bio-geographical steppe region. The steppe natural vegetation is also found at present on the versants of subsidence depressions, in the spaces between the agricultural parcels, on the road sides, on the temporarily uncultivated areas.

The natural habitats. The main types of habitats in Brăila county are represented by aquatic and terrestrial habitats (forests and meadows).

The aquatic habitats are represented by: salt and fresh water lakes, (permanent and temporary) swamps, moors, marshy areas and canals. These are rather diverse, being represented by the Danube branches arms and water surfaces from the floodplains to different fresh water or salt lakes located on the county territory, as well as by those which, despite the anthropic impact, have best preserved the natural biological diversity characteristic for the region.

The lakes in Brăila county are of three categories: clastocastic (the lakes in the subsidence depressions in loess or hollows), also named hollow lakes, meander lakes and floodplain lakes. The meander lakes and the lakes on an abandoned river branch are mainly

found in the Danube flood plain (Blasova), on Călmățui terrace, as well near Brăila (Lacul Sărat Brăila - Brăila Salt Lake).

An important category of surface waters consists of the salt lakes used for therapeutic purpose, with sapropelic mud. These are: Brăila Salt Lake, Lakes Căineni Băi and Movila Miresii.

Brăila Salt Lake has a big salinity and the bottom of the lake is covered with therapeutic mud, being the only therapeutic lake in the county, whose resources are put into value at present.

The Lakes Căineni and Movila Miresii were exploited until 1990-1993; afterwards, the assets for the exploitation of the therapeutic resources were privatized (Lake Căineni) or the exploitation facilities were abandoned and even demolished (Lake Movila Miresii). As regards the Lake Căineni, under concession for a 20-year period, no exploitation activity has been initiated so far. This lake has the characteristics of a deposit of mineral waters and sapropelic mud, its exploitation consisting of the use of these resources for therapeutic purposes.

The terrestrial habitats, with forest vegetation, are in general small flood plain forests (5% of the county area) with the following locations:

- 80% in the floodprone river plains of the Danube and of the rivers Buzău and Siret (mainly poplar and willow);

- 20% are terrace forests on the county area, mainly consisting of acacia and oak trees, the most important being: Vișoara, Colțea, Tătaru, Râmnicelu, Romanu, Rubla and Lacu Sărat. The terrestrial habitats represented by meadows (steppe meadows, river plain meadows and bushes) are strongly modified, with gramineous plants and different grasses.

The meadows habitats are better represented in the area of the Natural Park Balta Mică a Brăilei- The Small Swamp of Brăila, in the past affected by the grazing of animals that were left in a semi-wild state (cows, horses and pigs in particular), as well as the grazing of sheep, through accumulation and decomposition of the sheep manure, only those species remaining that were resistant to soil acidification. The bushes have the smallest development, belonging either to meadows, or growing in isolated spots, on limited areas in the flood plain with sandy banks.

Among the habitats protected in EU for the conservation of certain rare flora or fauna species, or in danger of extinction, those characteristic to the wet zones are best represented, the greatest diversity existing in the flood plain of the Danube.

Flora. In a more far past the vegetation characteristic to county Brăila was represented by steppe in the plain areas and by meadow and pond vegetation in Balta Brăilei. Steppe was upturned and replaced with crop vegetation (agricultural crops) in a share of 95%. It is to be found today only in islands, on uncultivated lands, and on the edge of the roads, along dugs and irrigation channels. From 230 species of wild flora inventoried in county Brăila there were not identified species of national or community interest.

Fauna. Nonvertebrates are represented through the biggest number of species, while the vertebrates are less numerous, both as species number and as number of individuals. At level of county Brăila, from the total of 305 species inventoried, 35 species are vulnerable, 18

species are periclitated, 4 species are critically periclitated, and 3 species are almost threaded. In county Braila there were inventoried 90 species, considered of community interest for which there must be constituted special areas of preservation and special areas for avifaunistic protection.

4. CONCLUSIONS

Land conversion for the urban, industrial, agricultural, tourism or transport development purpose can result in the degradation, destruction and fragmentation of habitats. In previous years, in Brăila county, the growth and intensification of the agricultural production systems took place through the transformation of certain natural or semi-natural ecosystems into arable land areas, which were equipped with facilities for the intensive production technologies application; thus, the Danube Flood Plain was partially dyked and transformed into agricultural ecosystems, as well as a great part of pastures with steppe vegetation on land areas with excess moisture.

The dyking consequences are the following: the modification of the hydrological regime of the Danube by increasing the intensity of floods; diminution of the capacity to retain nutrients by the floodprone areas; desiccated land salinization due to the fluctuations in the level of the phreatic water in soil; diminution of reproduction areas for the semi-migratory fish species; diminution of fish harvests.

The ecosystems modification was also caused by the utilization of certain inappropriate agricultural methods and techniques, such as the use of pesticides, the intensive or unorganized grazing, burning the stubble fields.

The replacement of the natural alluvial forests in Balta Brăilei by poplar and willow crops, the dykings, desiccations and the large agricultural monocrops practiced in the last 50 years of the last century have brought about deep qualitative and quantitative modifications of the county biodiversity.

A negative impact upon biodiversity in the last decade was produced by the replacement of the autochthonous species by alochtone species or clones with high productivity, obviously chosen according to economic criteria. The result was the disappearance of certain typical forests of willows, white and black poplars and of some steppe habitats due to afforesting the largest land areas possible that were not suitable for farming.

At the same time, the anthropic pressure upon the natural ecosystems in the last decades has induced the change of the ecological composition and structure, of the production and biodiversity support capacity respectively.

However, human activities destroy biodiversity and affect the capacity of the healthy ecosystems to produce this wide range of goods and services. The land destination modification, including agriculture intensification and urbanization, the over exploitation, pollution, the climate changes and the new species that compete against the indigenous flora and fauna generally contribute to the destruction of the natural ecosystems. After the destruction, their rehabilitation is an expensive process, or most often impossible.

It is necessary that the natural protected areas, in any category to have management plans and regulations and be awarded custody in order to:

- ensure security for the purpose of detection of any kind of poaching;
- run the recovery works of the ecosystems, rehabilitation and ecological reconstruction;
- be able to carry out projects funded by Community funds.

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*** www.ramsar.org

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