



## THE RAZIM-SINOIE LACUSTRINE COMPLEX. PROTECTION, RESOURCES, VALORIZATION

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### Abstract

The Razim-Sinoie lake complex is situated in northeastern Dobrogea, south of the Danube Delta and on the coast of the Black Sea (44°47' and 45°01' northern latitude and 28°30' and 29°08' eastern longitude), constituting the largest water surface in our country. It appeared and evolved in a former branched marine gulf, Halmyris, at the basis of a fossilized marine cliff (in the west), being connected to Sfântu Gheorghe branch (in the north) by means of several canals and backwaters and separated from the sea by several alignments of low and weakly consolidated marine bank-ridges, all these characteristics conferring it numerous particularities reflected in the hydrological, thermo, dynamical and hydrochemical regime of the lakes' water. The great diversity of the aquatic ecosystems and their accentuated vulnerability in relation to the anthropic intervention requires that their management and their economic valorization must have as a major desideratum the conservation and the protection of the biodiversity, in order to obtain an ecological balance. In order to attain these desiderata, by means of the Law no. 82 of November 20, 1993/ HG no. 248 of May 27, 1994 concerning the creation of the "Danube Delta" Biosphere Reserve, three types of areas were established within it, namely: strictly-protected areas (with integral protection), namely 18 (50600 ha, out of which in the Razim-Sinoie complex, 6 such areas add up to a total surface of 9123 ha), buffer-zones (223300 ha) and economic zones (306100 ha) where people currently practice traditional economic activities and which include all the rural and urban localities (Sulina)

**Keywords:** Razim-Sinoie, ecosystems, strictly-protected areas, management, economic valorization

### 1. General considerations

The great diversity of the aquatic ecosystems encountered in the Danube Delta and the Razim-Sinoie lacustrine complex, and their accentuated vulnerability in relation to the anthropic intervention imposes, as a major desideratum in their management, the

conservation and protection of their biodiversity in order to attain an ecological balance.

In time, even since the period between the two World Wars, there has been a series of researchers who, through the studies they made, tried to promote these principles, maintaining a balance between the valorization of the significant natural resources and the protection of this so valuable and yet so fragile area. One of these remarkable researchers of this area was **Grigore Antipa**. Following the propositions made during the first decennia of the 20<sup>th</sup> century and the works carried out by the Direction of the State-Run Fisheries (Direcția Pescăriilor Statului), an efficient hydro connection was achieved between Sfântu Gheorghe branch and the Razim-Sinoie complex.

During the period 1930-1950, the efforts made by some researchers led to the declaration of certain areas of the Danube Delta and of the Razim-Sinoie complex as *natural reserves*, some of them being introduced later on in the world list of the biosphere reserves - as part of UNESCO's "The Man and the Biosphere" (MAB) international program. In 1938, in the Razim-Sinoie lacustrine complex, by means of the Decision of the Board of Ministers HCM no. 645, the Popina Island and Periteașca-Gura Portiței-Bisericuța area were declared as reserves.

During the period that followed, after 1950, as a consequence of the creation of the Commission for Natural Monuments (Comisia Monumentelor Naturii) of the Romanian Academy, the number and surface of the reserves in the Danube Delta and in the Razim-Sinoie complex grew (HCM no. 891/1961; HCM no. 528/1970), amounting to six: three ornithological reserves, a forest reserve and two complex reserves, occupying a total area of 41046 ha.

In the Razim-Sinoie complex were reconfirmed the two reserves declared previously, and to them were added the *protected nesting areas*.

The **Periteașca – Leahova – Portița** reserve, covering 3900 ha, situated in the Razim-Sinoie lagoon complex, was made up of a proportion of up to 50% lakes, offering optimal conditions for the lacustrine birds and winter guests. In this reserve there were both biocenoses developed on dry sands from the tops of the bank ridges or on sands bathed by the sea waters or by the water of the Razim lake, and also biocenoses adapted to the lakes with significant variations of salinity.

The **Popina Island** reserve, 98 ha, situated north of Razim Lake, is the nesting place of the *Tadorna ferruginea* and of other migratory birds, especially during the autumn migration.

Beside the *protected natural reserves*, a series of *resting places or refuges* have been created, which represent the permanent nesting areas of the migratory birds.

In the area of and near the Razim-Sinoie complex have been created four such refuges, seeing that through this area pass most of the itineraries of the Southeastern Europe migratory birds: the **Sărăturile** refuge, situated south of Murighiol locality is a nesting place for *Himantopus himantopus* and *Recurvirostra avosetta*; the **Fundul Goloviței (Ceamurlia)** refuge shelters colonies of *Egretta alba* and *Platalea leucorodia*; the **Istria-Sinoie** refuge occupies the gulf situated near the homonymous localities and

constitutes a significant area for the nesting of *Tadorna tadorna*; **Grindul Lupilor**, during the period that precedes the autumn migrations, becomes one of the places of maximum avifauna density, while during the summer the most encountered avifauna here is the crane.

Seeing that in these natural reserves and resting places for nesting have been encountered rare species of animals and birds and that there is a special scientific interest about them, some of them have been decreed natural monuments or protected by the law, as for instance: *Platalea leucorodia*, *Egretta alba*, *Pelecanus onocrotalus*, *Pelecanus crispus*, *Tadorna tadorna*, *Tadorna ferruginea*, *Himantopus himantopus*, *Recurvirostra avosetta*, *Otis turda*, *Cygnus olor*, *Cygnus cygnus* etc.

However, the period before 1989 was generally characterized by massive anthropic interventions in the Danube Delta and in the Razim-Sinoie complex, determined by the **Program of total arrangement and exploitation of the natural resources of the Danube Delta (Programul de amenajare și exploatare integrală a resurselor naturale din Delta Dunării)**, elaborated and coming into force through a decree of the State Council of 1983, according to which a significant part of the delta, including Razim-Sinoie lacuster complex, was to be arranged for agriculture.

After 1989, following the political changes and given the new vision on the natural patrimony conservation and protection, through the **Decree of the Romanian Government no. 983/1990** concerning the organization and functioning of the Ministry of the Environment, published in the Official Gazette (Monitorul Oficial) no. 105/ September 14, 1990, was created the Danube Delta Biosphere Reserve.

So, in the article 5 point 1, this law mentions that: „*For the guidance and the control of the entire scientific, tourist and leisure activity of the Danube Delta, is created the “Danube Delta” – biosphere reserve – an institution with juridical personality subordinated to the Department of the environment.*”

The 3<sup>rd</sup> point of the same article delimits the surface of this reserve, amounting to 580000 ha, stating that it includes: “*the Danube Delta, the Razim Sinoie lagoon complex, the Danube’s waterside between Isaccea and Tulcea, the seacoast between Chilia branch and Midia Cape up to the 20 m isoheight, and the maritime Danube – up to Cotul Pisicii*”.

The new structure’s general objectives established by the law (art. 5 point 4) were: *to ecologically redress the Danube Delta and to conserve the genofund (biodiversity) of the ecofund; to know the productive capacity and to establish the dimensions of the exploitation of the Danube Delta resources, within the admissible ecological limits.*

The provisions of the HCM no. 983/1990 came into force through the Law no. **82/ November 20, 1993** concerning the creation of the **Danube Delta Biosphere Reserve**.

According to this law, the Danube Delta Biosphere Reserve is structured as follows: **strictly protected areas** (with integral protection), namely 18 (50600 ha), **buffer zones** (223300 ha), surrounding the strictly-protected areas, in order to gradually reduce the anthropic pressure and **economic zones** (306100 ha) where people currently practice traditional economic activity and which include all the rural and urban localities (Sulina).

On the basis of this legal framework, The Scientific Council of the Danube Delta Biosphere Reserve approved, for the period 1995-1999, the *Management Plan* containing 35 objectives and 87 projects, grouped into four categories, namely: general objectives to redress the ecological condition of the Danube Delta Biosphere Reserve, the legislative framework and forms of cooperation and promotion concerning the reserve; objectives concerning the durable economic use of the Danube Delta Biosphere Reserve area and the use of natural fertilizers (agriculture without chemical fertilizers and pesticides, use of natural resources – common reed, mace reed, wood, fish, bird and mammal fauna, ecotourism); objectives and activities in the buffer zone which are to contribute to the reduction of the anthropic pressure on the strictly protected areas and to the rehabilitation of the previously degraded habitats; objectives concerning the strictly-protected areas, like the improvement of the water quality, research and monitoring of the biodiversity, for its conservation and protection (*Management Objectives for Biodiversity Conservation and Durable Development in the Danube Delta Biosphere Reserve, Romania / Obiectivele de management pentru conservarea biodiversității și dezvoltarea durabilă în Rezervația Biosferei Delta Dunării din România*, 1995, Gâștescu P., 1996).

For the period that followed, 2002-2006, the *Management Plan* comprised 18 objectives with 128 projects, some being a continuation of those of the period 1995-2000, which had a permanent character or had not been carried out because of the lack of funds.

Since 2006, for at least 10 years, the complex problems of the Danube Delta Biosphere Reserve will constitute the objectives of the MASTER PLAN for the Danube Delta Biosphere Reserve, which has been presented and developed in a workshop during the 14<sup>th</sup> “**Deltas and Wetlands**” **International Symposium, September 2005**.

The Master Plan project comprises 6 chapters, namely: the plan's characteristics; the institutional context; the condition of the Danube Delta; an integrated approach for the planning; an analysis of the strategies and interventions; conclusions and recommendations. In each chapter are included numerous objectives of which we mention: the promotion of the economic growth and social development concerning the water and sewage systems in the localities of the Danube Delta, the transport on water and on land in-between the localities, the protection against floods, ecotourism, fish resources, education, culture and health, all these in relation to the biodiversity conservation and protection, ecological reconstruction, integrated monitoring and management (Gâștescu P., Știucă R., edit., 2008).

## **2. Strictly protected areas**

They have been established through the Governmental Decision HG no. 248/ May 27, 1994, in the annex of this decision being determined and delimited the areas of the strictly-protected areas, of the buffer zones and of the economic zones. Out of the total surface of the 580000 ha reserve, the strictly protected areas represent 50600 ha, the

buffer zones 223300 ha and the economic zones 306100 ha, out of which 11425 ha are under ecological reconstruction.

For the Razim-Sinoie complex have been delimited 6 strictly protected areas (fig. 1.) with a total surface of 9123 ha.

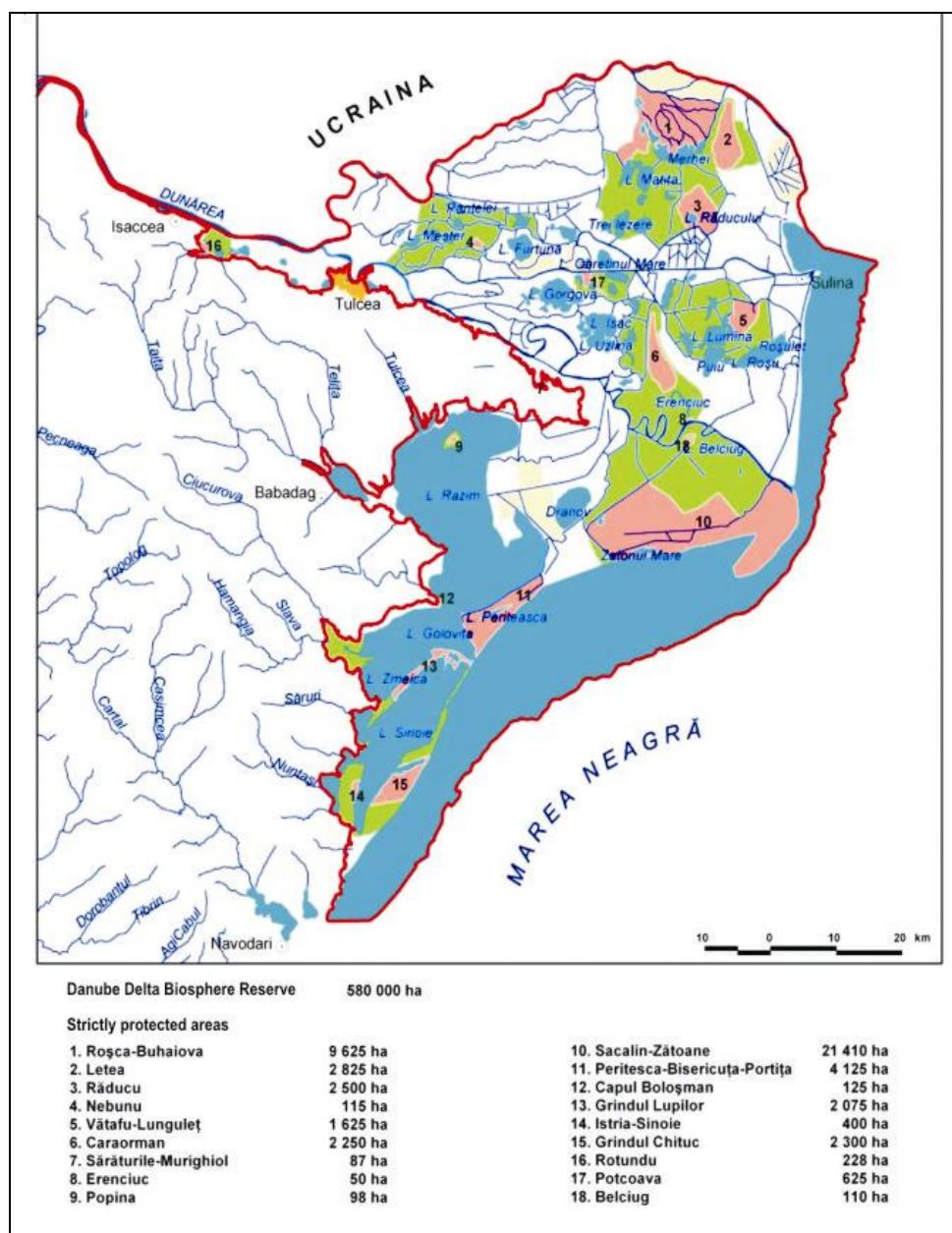
**Popina Island** (98 ha). Delimitation. The Popina Island is situated north of Razim Lake, near the fish arrangements of lazurile and Sarinasuf and near the lazurile locality.

Ecological characterization. The Popina Island represents the remains of a rocky continental top of a bank ridge, which constitutes an important resting place for the migratory birds and a nesting place for *Tadorna tadorna*. In spring, in this area with poor and low vegetation, one can encounter marsh birds (wagtails coming from Congo), wood birds: *Luscinia megarhynchos*, *Emberiza melanocephala*, *Melanocorypha colandro* etc. The thermal springs situated on the northern border of the island (not yet studied) confer the island and extra scientific incentive. The invertebrate fauna (also insufficiently studied) includes rarities like the venomous spider "the Black Widow" (*Lactrodextra*) and the giant millipede (*Scolopendra cingulata*).

**Periteasca - Leahova** (4125 ha). Delimitation. The Periteasca-Leahova area is situated south of the reserve, being delimited in the north-east by Periteasca Canal, between the Black Sea and Razim Lake, in the north, by Razim Lake, from Periteasca Canal to the Bisericuta Island, including it, in the west, by Golovita Lake, from the Bisericuta Island up to Gura Portitei, in the south and south-east, by the Portita backwater and the shore of the Black Sea, between the fishing grounds Portita and Periteasca, excluding the two fishing grounds, and the camping Portita.

Ecological characterization. Situated in the Razim-Sinoie lagoon complex, this zone represents a mosaic of slightly halophile tops of bank ridges and shallow lakes (Periteasca, Cosna, Pahome, Ranec, Leahova), undergoing a process of continual sweetening after the closure of the opening Gura Portita and the consolidation of the littoral beach. Characteristic for this area are the biocenoses developed on the dry sands of the tops of bank ridges, on the sands bathed by the sea or by Razim Lake, and the biocenoses adapted to significant salinity variations. It is a nesting area preferred by the lacustrine species, of the *Tadorna* sp. (Bisericuta Island), and by the laridae and sternidae (the halophile tops of bank ridges). It is an important refuge for resting and feeding for the winter guests and for other species (especially during the autumn migration). At the same time, it is the preferred daily migration refuge of the *Branta ruficollis* population during its stay in Dobrogea. The Bisericuta Island (rocky island, outpost of the pre-Deltaic relief) dominates, together with Dolosman Cape, the landscape between the Razim Lake and Golovita Lake.

**Dolosman Cape** (125 ha). Delimitation. It is represented by the eastern extremity of the Dolosman higher area, near the locality of Jurilovca, including the area of the ruins of the Greek-Roman fortified city of Argamum (5<sup>th</sup> century B.C.) and the abrupt slope of the cliff from this extremity, up to the water taking device of the pumping station for irrigations from Salcioara.



**Fig. 1. The Danube Delta Biosphere Reserve**  
(according to Gâștescu P., Știucă R., edit., 2008)

Ecological characterization. This area is important for the conservation of the xerophite vegetation, for the nesting of *Apus apus*, *Denante pleshanka*, and for the protection of *Vormela perpegusna*, *Coluber jugularis* and of the water snake. This area has an archaeological importance as well, preserving certain vestiges of ancient civilizations.

The bank ridge top **Grindul Lupilor** (2075 ha). Delimitation. The area Grindul Lupilor is situated in the south of the reserve, being delimited in the north-west by the Zmeica Lake, in the east, south and south-west, by the Sinoie Lake, in the west, by Canal 2, in the north, by the Golovita Lake.

Ecological characterization. Due to its position, between the lakes Razim and Sinoie, having a low relief (0.5-1.5 m altitude) and a vegetation that is specific for the sandy soils of marine origin, this area represents an important nesting and feeding refuge for the birds. Especially during the autumn migration, this area becomes an impressive concentration of ornithological fauna and, especially, of winter guests (geese, ducks), as in Sinoie lake the water is saltier south of Lupilor bank ridge top than northwards, towards Razim. Due to its low altitudes and its favorable conditions, the area has as well a great importance for the natural reproduction of the following fish species: *Ciprinus carpio*, *Stizostedion lucioperca*, *Abramis brama* etc.

**Istria-Sinoie** (400 ha). Delimitation. The Istria-Sinoie area is situated in the south-west of the reserve, in the north-east extremity of the Saele bank ridge top and includes the higher land made up of green schysts on which the Histria archeological complex is situated, and a part of Saele bank ridge top, situated between Cetatea Histria road – Nuntasi Village and the eastern area of Saele bank ridge top, having a length of about 6 km in the south and a width of around 1300 m in the north and 300 m in the south.

Ecological characterization. In this area there is a great variety of bird species: *Tadorna tadorna*, ducks, geese etc., sometimes appearing as well new species for our country. This area has a special archeological value as well. The fortified city of Histria was created in 657 B.C. by the Greeks of Milet, in part because of the richness in fish of this area.

The bank ridge top **Grindul Chituc** (2300 ha). Delimitation. This area is situated in the southern extremity of the reserve. It comprises the northern part of the bank ridge top bearing the same name (which is being formed at present), the largest bank ridge top fragmenting or delimiting the Razim-Sinoie lake complex. It is made up of an agglomeration of small lakes, being delimited towards northeast by the watermark 13, and southwards by the watermark 10. A conventional line between the watermark 10 and the border of the Sinoie Lake, at about 1.5 km under the Chituc Sinoie point, gives its southwestern limit. Its northwestern limit is the Sinoie Lake, while its southeastern limit is the access way to Periboina fishing ground, parallel to the Black Sea shore, between the watermarks 10 and 13.

Ecological characterization. The area is valuable for its morphological configuration characterized by a succession of offshore bars, dunes and lakes, the last being dominant, oriented diagonally on the present shoreline and being placed like the lines of a fan. The vegetation is characteristic for the littoral area with salty sandy soil. It is important for the birds' migration and winter stay, the salty waters from this area turning into ice at lower temperatures.

The *buffer zones* with a differentiated protection regime amount to 223300 ha (38.5 %) and, as their denomination shows, almost always surround the strictly protected areas, in order to reduce the economic activity and the anthropic pressure on the respective areas. The buffer zones have similar biological characteristics to the area they surround.

For the protected areas of the Razim-Sinoie complex have been delimited the following buffer zones:

**The Popina Island** (260 ha). It safeguards the strictly protected area that bears the same name and includes a belt which surrounds the island towards the Razim Lake, being 500 m wide from the shore of the island.

**Dolosman Cape** (28 ha) It shields the strictly protected area that bears the same name. Delimitation: in the northeast, the strictly protected area of Dolosman Cape; in the south, the border of Razim Lake; in the west, the exploitation road situated on Dolosman Hill.

**Zmeica-Sinoie** (31510 ha). It shields the strictly protected areas of the Lupilor, Istria-Sinoie and Chituc bank ridge tops. Delimitation: northwards, the limit of the Ceamurlia Lake towards the Plateau of Dobrogea up to the Golovita Lake, then a curved line up to Zmeica bank ridge top, along it up to Lupilor bank ridge top and then following its northern limit up to the Black Sea shore; in the east, the Black Sea shore up to Plantatiei (Chituc) bank ridge top; southwards, Plantatiei bank ridge top, the southern limit of the Sinoie Lake, the plantations of the northern area of the Vadu locality, the southern limit of the Tuzla Lake; westwards, the western border of the Tuzla-Nuntasi Lakes, the western border of the Istria Lake, the area known as "Movilele Dese" ("the frequent mounts") and then the limit of the swampy zone up to Sinoie mount (the point known as "la Stanca") and, then, on the western shore of the Zmeica Lake and of the Golovita Lake (the Cape Negru) and the western limit of Ceamurlia Lake up to the locality of Ceamurlia de Jos.

**Periteasca-Leahova** (210 ha). It safeguards the strictly protected area that bears the same name and has the following boundaries: eastwards, the eastern border of Periteasca Canal, from the Razim Lake to the Black Sea shore; southwards, the Marine buffer zone; westwards and northwards, a girdle that is about 100 m wide towards the Golovita Lake and towards the Razim Lake up to Periteasca Canal.

**The marine buffer zone** (103000 ha). It includes the area comprised between the Black Sea shore and the 20 m isoheight. Its northern limit is Bara Sulina, while the southern limit is represented by a line that is parallel to Paralela, which starts in the Chituc bank ridge top, towards the southern extremity of the Sinoie Lake and encounters the 20 m isoheight.

To these, we must also add the *economic zones* that include an area arranged for different purposes and those maintained under free regime for floods, which are not mentioned in the groups 2 and 3 (respectively the strictly protected areas and the buffer zones) and which are included in the Danube Delta Biosphere Reserve, which amounts to 306100 ha of which 11425 ha are under ecological reconstruction.



### 3. The resources and their valorization

Seeing that the Razim-Sinoie lacustrine complex is part of the Danube Delta Biosphere Reserve, the carrying out of any kind of economic activities is allowed only in certain areas, with the permission of the ARBDD according to the legal provisions in force.

Starting from the concept of Biosphere Reserve, from the very beginning, from the first normative acts was pursued the accomplishment of these objectives without neglecting, however, the local population, and ensuring the rights of the local people: *“The right of the local population of the territory of the Danube Delta Biosphere Reserve to keep their specific local customs and their traditional economic activities is guaranteed. The Administration of the Reserve will ensure, through compensations if such the case, the continuation of the traditional economic activities”* (Law no. 82/1993, art. 8).

These provisions will be maintained and completed as well in the other normative acts emitted later on, as it is shown by the article 42 points 2 and 3 from HG 367/2002: *„In order to cover their strictly domestic needs, the population that has a stable domicile within the area of the Reserve can harvest for free a total quantity of two tons of common reed and mace reed per family per year, in areas clearly determined by the Administration of the Reserve, zones that must not coincide with the area of economic valorization of these resources ...”* or, at the following point *„The population having their domicile within the area of the Reserve can fish, tax-free, on the basis of the permit delivered by the Administration of the Reserve, a quantity of fish destined for their own consumption, during the admitted period and from admitted species”*.

Concerning the economic agents, in order to know the economic activities that take place in the territory of the Danube Delta Biosphere Reserve, an inventory of the economic agents was carried out for each locality. In order to achieve and update the databank concerning the dynamics of the economic activities, there were created surveys on activities, based on which the necessary information was collected at the trading companies. At the same time, there was collaboration with the Cadastre and Agricultural Land Organization Office (Oficiul de Cadastru și Organizarea Teritoriului Agricol - OCOTA) of Tulcea, with the Agricultural Direction (Direcția Agricolă) and with the Statistical Direction (Direcția de Statistică) of Tulcea County (Gâștescu P., Știucă R., edit., 2008).

**The fish resources and the fishing** have represented from times out of mind an efficient way of valorizing the natural resources from this geographic area, there being mentions of the richness in fish in numerous antique or modern authors.

In the fortified city of Histria, during Antiquity, there was an ample commerce, where the fish held an important percentage, a fact shown by an epigraphic piece of information discovered by V. Pârvan, dated around the year 100 A.D., which reveals the boldness of the Histrians defending during the Roman epoch their ancient rights of fishing in this area. They require and obtain *“the respect of the older privileges, according to which they can fish in the Delta, they have the right to cut pine wood for their torches, without*

*paying and the boundaries of their rural territory are to be respected*" (Rădulescu A. Bitoleanu I., 1979).

During the modern period, the importance of this resource is highlighted by the creation of an adequate legislative framework. In 1895, a state-run direction was created for the administration of this resource and, later on, in 1896, on the initiative and according to the conception of the savant Grigore Antipa, was approved the first fishing law.

On the initiative of Grigore Antipa take place the first arrangement measures for the Razim lake, in order to increase the fish production, the results being those expected, presented in a paper of 1921 (Antipa Gr., 2005): *"I will just say that we have carried out systematic improvement works in the Razim lake and their effect was almost a tenfold growth of this lake's production"*.

The administration of this activity while the savant Grigore Antipa was director of the Fisheries was based on the provision to take into account the relation man-exploitation-environment, trying to achieve a balance between them.

After 1950, the aim was an increase of the profits, without always taking into account the general characteristics of the ecosystems and their real possibilities, sometimes with negative effects in time. In this sense, a series of constructions and arrangements were made for piscicultural purposes, a series of precincts that practically surround the lakes Razim and Golovița: the arrangements from Sarinasuf-Agighiol, Enisala, Babadag, Toprachioi, Zebil (Tăuc), Sălcioara (6 Martie) Jurilovca-Lunca, the piscicultural activity from the Danube Delta being subordinated to the Station of the Danube Delta.

The legislative framework existing during that period, the **Law no. 12** of July 26, **1974** concerning the *piscicultural activity and fishing* contained some special provisions referring to the Razim-Sinoie complex as well, which attempted to protect the fish stocks by delimiting the fishing periods.

After 1989, through the creation of the Danube Delta Biosphere Reserve and the creation of the **strictly protected areas, the buffer zones, the economic zones** or the zones under ecological reconstruction, fishing became possible only in certain areas and under the provisions stipulated by the law. Any economic activity that is carried out on the territory of the reserve has to be authorized by the ARBDD, according to the provisions stipulated beginning with the HG 983/1990 and maintained in all the subsequent normative acts (the Law no. 82/1993 with its subsequent completions and modifications).

The new fishing law, the *Law no. 192* of April 19, **2001** concerning the *piscicultural patrimony, fishing and aquaculture* with its subsequent completions and modifications (OUG no. 76/2002, **Law no. 298/2004** and OUG no. 69/2004) confirm and certify the provisions of the laws invoked above both concerning the administrators and the rights of the local population. At the same time, the Law no. 192/2001 maintains the special provisions concerning the Razim-Sinoie complex, establishing the prohibition periods and the areas where the fish stock exploitation can take place.

Beside the industrial exploitation of the piscicultural resources in the Razim-Sinoie lacustrine complex, there were delimited areas where fishing as sport and leisure fishing can be practiced, according to the provisions of the laws in force.

Beginning with the year 2002, in the areas situated on the public domain of national interest from the territory of the Biosphere Reserve, according to the new legal framework (Law no. 219/1998 on the regime of granting, HG 216/1998 and HG 311/April 4, 2002 for the approval of the piscicultural resources valorization granting), auctions were organized for the granting of the right to valorize this resource, respecting the ecological conditions and the maximum capture approved by the law (Table no. 1).

**Table 1.**

**Repartition of the fish resources and captures in the year 2005  
in the Razim-Sinoie complex**

Fishing area	Approved capture					Reported capture				
	Total	Sweet water and sea species (kg)	Sturgeons/ caviar (kg)		Danube mackerel (kg)	Total	Sweet water and sea species (kg)	Sturgeons/ caviar (kg)		Danube mackerel (kg)
Razim-Sinoie	1,410,447	1,410,447	-	-	-	991,858	991,858	-	-	-
Perișor-Periboina	58,334	47,606	590	52	10,137	13,037	240	36	1	12,761
Periboina-Cap Midia	47,589	46,999	590	52	-	10,689	9,749	-	-	940

(according to the Yearly Report on the Environmental Condition in the Danube Delta Biosphere Reserve, 2005)

**The cynegetic resources.** Beside the piscicultural resources, the fauna, respectively the cynegetic species represent as well an important resource. The fauna resource underwent permanent modifications and changes, both because of the anthropic intervention and because of the general environmental changes. The legislation in force (the Law no. 103 of September 23, 1996, the Law of the hunting patrimony and of the game protection no. 235/ September 27, 1996) mentions that the hunting patrimony in the area of the Danube Delta Biosphere Reserve is made up of 14 species of mammals and 54 species of birds, and that this list can be modified according to the results of the researches in this domain.

Of the species of mammals that belong to the hunting patrimony included on this list there are: hare (*Lepus europaeus* Pallas. - sin. *Lepus capensis*), deer (*Capreolus capreolus* L.), wild boar (*Sus scrofa attila* Thomas), fox (*Vulpes vulpes* L.), jackal (*Canis aureus* L. appeared relatively recently, first noticed on Lupilor bank ridge top, then on the salty lands "Sărăturile" from Sfântu Gheorghe), wild cat (*Felis silvestris* L. – whose hunting is forbidden by the law), *Lutra lutra* L. and *Mustela lutreola* L. (these two species are protected by the Convention from Berna), *Mustela herminea* L., *Mustela nivalis* L., and among the bird species of interest for hunting there are: the goose, namely *Anser fabalis*,

*A. anser rubrirostris*, *A. albifrons*; the wild ducks, which are on top of this list among the species of aquatic game, namely *Anas platyrhynchos*, *Anas querquedula*, *Anas crecca*, *Anas strepera*, *Anas penelope*, *Anas acuta*, *Anas clypeata* etc., the pheasant (*Phasianus colchicus* L.), the partridge (*Perdix perdix* L.), and from among the predacious birds – the gray crow (*Corvus corone*), the magpie (*Pica pica*) etc. The hunting of *Fulica atra*, *Mergus albellus* and *Oxyura leucocephala* is strictly forbidden.

The practice of hunting is allowed under the provisions stipulated by the Law no. 82/1993 and of the Law no. 103/1996. On the territory of the Danube Delta Biosphere Reserve are delimited 15 zones where people can practice hunting, and in the Razim-Sinoie complex, there is a number of 3 such zones: *Mahmudia* (15200 ha are included in the areas from Sf. Gheorghe Delta, north of the Dunăvăț Canal, and in the Razim-Sinoie complex, surrounding the Fundea gulf and the northern zone of Razim lake, along the piscicultural arrangements of Sarinasuf-Agighioli, up to Sarichioi), *Enisala* (8200 ha in the reeds situated in-between the lakes Babadag and Enisala, in the reeds and on the lakes of Babadag, Toprachioi, Zebil), *Ceamurlia* (4900 ha, it begins in the area of the Ceamurlia gulf and continues west of the Zmeica lake, along the western borders of the lake Sinoie beginning from the south of the Lupilor bank ridge top up to the north of the Istria Lake) and *Sinoie* (5200 ha, made up of the western borders of the lakes Istria and Nuntași and the south of Chituc bank ridge top).

**The reed** represents another natural resource that can be valorized both for industrial purposes and for the needs of the population in the Razim-Sinoie complex. There have been attempts of valorization for industrial purposes of this Danube Delta resource, beginning with the year 1956, when there were created reed arrangements and the cellulose plant from Brăila, but they were abandoned later on because of their low profit and of their high exploitation and processing costs.

Under these circumstances, after 1989, the new legal framework determined by the Law no. 82/1993 that stipulated the creation of the Biosphere Reserve, by the Law no. 219/1998 concerning the granting regime, by HG 216/1998 and by HG no. 153/2002 concerning the reed resources from the area of the Danube Delta Biosphere Reserve a 46735 ha surface of reed was established, in several areas situated in the economic zone.

**Tourism.** The Razim-Sinoie lacustrine complex and the Danube Delta represent one the most important tourist regions of Romania, the complexity and the great variety of the landscape (from a morphohydrographic, fauna and flora viewpoint) constituting an element of attractiveness for tourists, beginning with the second half of the 20<sup>th</sup> century.

As tourism tends to become one of the most important economic activities in Romania during the next years, and the increase of the number of tourists will have an impact on the environment, the forms and types of tourism that can be practiced here must have in view the protection and conservation of the biodiversity of the water and land ecosystems from this area, whose balance is fragile and easy to upset.

The new status of the Danube Delta and of the Razim-Sinoie complex after 1990, when it became a Biosphere Reserve, allows the practice of tourism only in certain areas, the access towards them being permitted only via the already determined itineraries.

The types of tourism that can be practiced here are those related to the existing natural environment, which offer the possibility of practicing from diverse forms of spa and helio-marine tourism to specialized forms of tourism for biologists, botanists, ornithologists or to the practice of fishing and hunting as sports.

The bioclimate of the maritime littoral of the Razim-Sinoie complex, being a consequence of the main climatic elements, through its distinct features, slightly different than those of the littoral south of Midia Cape, favors these activities especially during the period of the months from May to September.

The natural potential is completed by the anthropic potential, especially represented by: the archeological vestiges and the ruins of the most ancient fortified city found on the Romanian territory, founded during the second half of the 7<sup>th</sup> century B.C. in **Histria**, the archeological vestiges and the ruins of the fortified city of **Argamum** (Doloșman Cape, Jurilovca), the Byzantine fortified city found on the **Bisericuța Island** from Razim Lake, the traces of the Genovese fortified city dating from the 12<sup>th</sup> – 14<sup>th</sup> century from **Enisala**, the *mosque of Ali Gazi Pasha* and *The Museum (exhibition) of oriental art*, which is home to a valuable collection comprising costumes, woven materials and embroideries, ceramics from **Babadag** or the *Museum dedicated to the Peasant Household* from **Enisala** etc.

At present have been established 9 tourist areas, each having a certain degree of importance, calculated according to its accessibility, its tourist resources, its technical-material endowment, the non-degraded natural environment, the possibilities of infrastructure arrangements and the position of the strictly-protected area with their respective buffer zones. In these areas, the Administration of the Danube Delta biosphere Reserve approves the tourist itineraries annually, they being usually seven, counted with Arab numbers (1, 2, 3, 4, 5, 6, 7) and other 12 secondary itineraries (8-19).

For the Razim-Sinoie complex, have been approved 3 tourist water itineraries, of which 2 main ones: the itinerary 4 Murighiol-Portița and the itinerary 5 Jurilovca-Portița and a secondary itinerary 14 Jurilovca - Cherhanaua Periboina - Cetatea Histria - Jurilovca and a tourist itinerary on land: D7 Nuntași – Istria Fortress – Sinoie Lake and back.

The main tourist area here is **Gura Portiței** with its beach, a fact that is highlighted as well by the two main itineraries approved by ARBDD, the annual number of tourists in this area being slightly above 10 000-11 000, according to some studies, and recording a constant increase since the year 2000.

If the tourist endowments from Portița consisted, before 1989, in a small number of small houses inadequately equipped, beginning with the year 2000, here began to be used for tourism over 200 places in small houses and even minihotels, and the pressure exerted on the environment by the incoming tourists has led to a significant degradation of the natural ecosystems.

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