



United Nations Educational,
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Srebarna Lake Biosphere Reserve - biodiversity, dynamics and management

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Srebarna Lake Biosphere Reserve

The Srebarna Lake was designated as a **Monument of World Cultural and Natural Heritage** (1983), **UNESCO biosphere reserve** (1977), **Ramsar site** (1975) and **Important Bird Area** (1990) because of its extremely rich ornithofauna and mainly because of the breeding of globally threatened species Dalmatian Pelican (*Pelecanus crispus*), Pygmy Cormorant (*Phalacrocorax pygmeus*) and Ferruginous Duck (*Aythya nyroca*).

The lake of Srebarna, situated in North-Eastern Bulgaria on the right bank of the Danube River (44° 05' n.l. and 27° 07' e.l.) between the river kilometres 393 and 391. The total territory of the reserve is 902.1 ha including the Srebarna Lake with slightly alkaline to neutral waters and the Danubian island Devnia.



The Rarty of the Srebrana Reserve

The following characteristics of the reserve presents its value:

- A nesting colony of Dalmatian pelicans that is unique for Bulgaria and rare for the Balkan Peninsula and for Europe;
- Bulgaria's only traditional nesting occurrence of the Great Egret (*Egretta alba*);
- One of Europe's few nesting occurrences of globally threatened bird species like the Pygmy Cormorant (*Phalacrocorax pygmaeus*) and the Ferruginous Duck (*Aythya nyroca*);
- Bulgaria's only place with floating reed-beds;
- One of the few wintering grounds of globally threatened bird species like the Lesser White-fronted Goose (*Anser erythropus*) and the Red-breasted Goose (*Branta ruficollis*);
- The only well preserved marsh along the Bulgarian sector of the Danube riverside.

Biodiversity of Srebarna Reserve

Habitats and plants

The vegetation are presented mainly by rooted hydrophytic, hygrophilic, hygromesophilic, mesophilic and mesoxerophilic communities.



The dominant plant association is that of the Common Reed (*Phragmites australis*), which occupies about two-thirds (400 ha) of the Reserve's total surface area. Gray Willow (*Salix cinerea*) and Purple Willow (*Salix purpurea*) bushes grow in some places. The second widest spread plant species after the Reed is the Lesser Reedmace (*Typha angustifolia*). Of all 139 vascular plant species hosted by the Reserve, 11 are rare or endangered.



Fauna of Srebarna Reserve

The animals of Srebarna Reserve are presented of 1000 invertebrate and 318 vertebrate species.

The **fish** fauna of the Srebarna Lake is represented mainly by Danubian species. This is due to the close disposition of the lake with the Danube. In the last 40-50 years, the fish fauna has been changing depending on the state of the connection between the river and the lake. In the reserve, 23 fish species (or 18,1% from the Bulgarian freshwater fish fauna) were established. In Srebarna, there are 12 species of **amphibians**, 15 species of **reptiles** and there are 42 species of **mammals**.



Birds in Srebarna Reserve

The birds are relatively well studied. The bibliography on the birds of the reserve includes 97 scientific papers, reports and other sources.

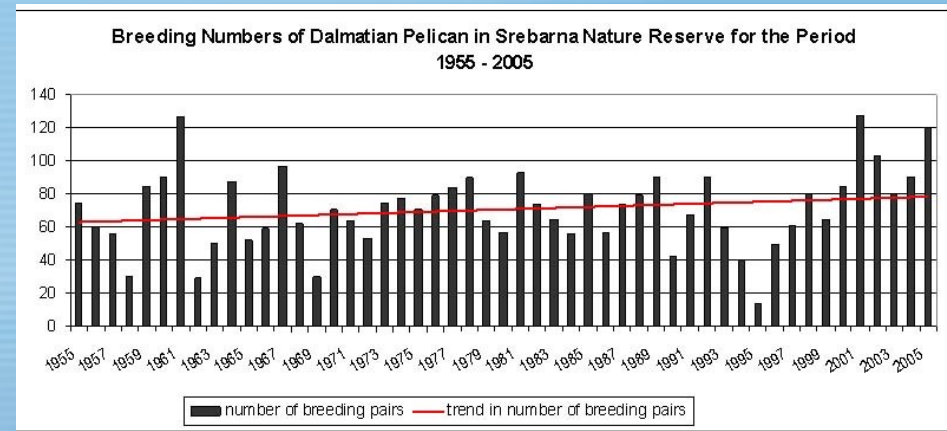
The number of bird species established at the Srebarna Lake and its vicinity is 230, or 57,5% from the Bulgarian ornithofauna (which consists of 400 species). 132 of them are breeding and 98 - wintering. 58 of all bird species are listed in Bulgarian Red Data Book (1985). Nine species are globally threatened and three of them are presented in Srebarna with stable and unique populations: Pygmy Cormorant (*Phalacrocorax pygmeus*), Dalmatian Pelican (*Pelecanus crispus*) and Ferruginous Duck (*Aythya nyroca*).



The greatest treasure of Srebarna reserve is the nesting colony of Dalmatian Pelican (*Pelecanus crispus*).

The data shows that Srebarna is a traditional breeding site for the Dalmatian Pelican and that its population fluctuated. For the period 2001-2005 the breeding number varied between 80 and 128 pairs. There are also some spatial changes of the colony.

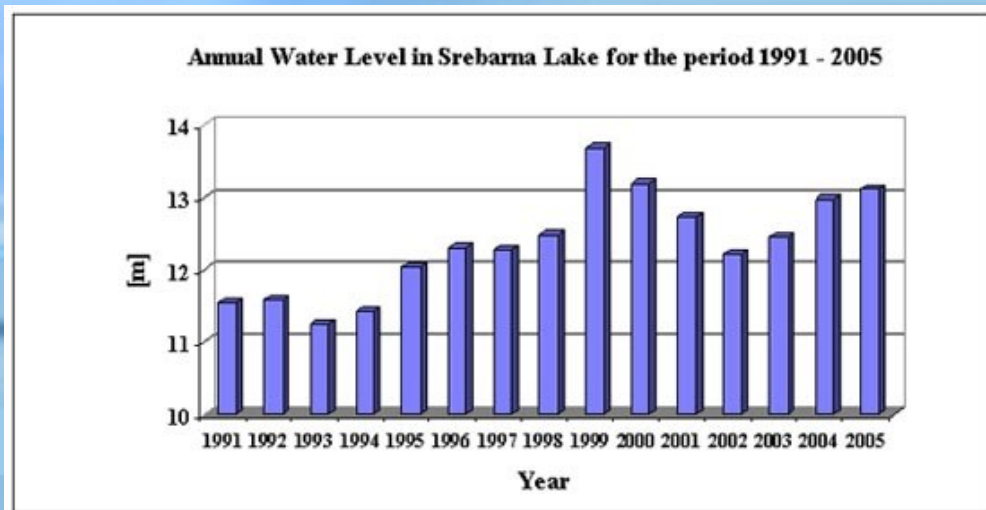
In 2005, in the result of strong North-NorthWest winds and unusual high water level, the reed islet of pelican colony detach from the main reedbeds. The reed islet moved in the south part of the reserve (1 km from the previous place). Fortunately the young pelicans was successfully raised.



The breeding colony at Srebarna Lake and its dynamics from 1955 to 2005.
Photo: Pavel Simeonov & Tanyo Michev.

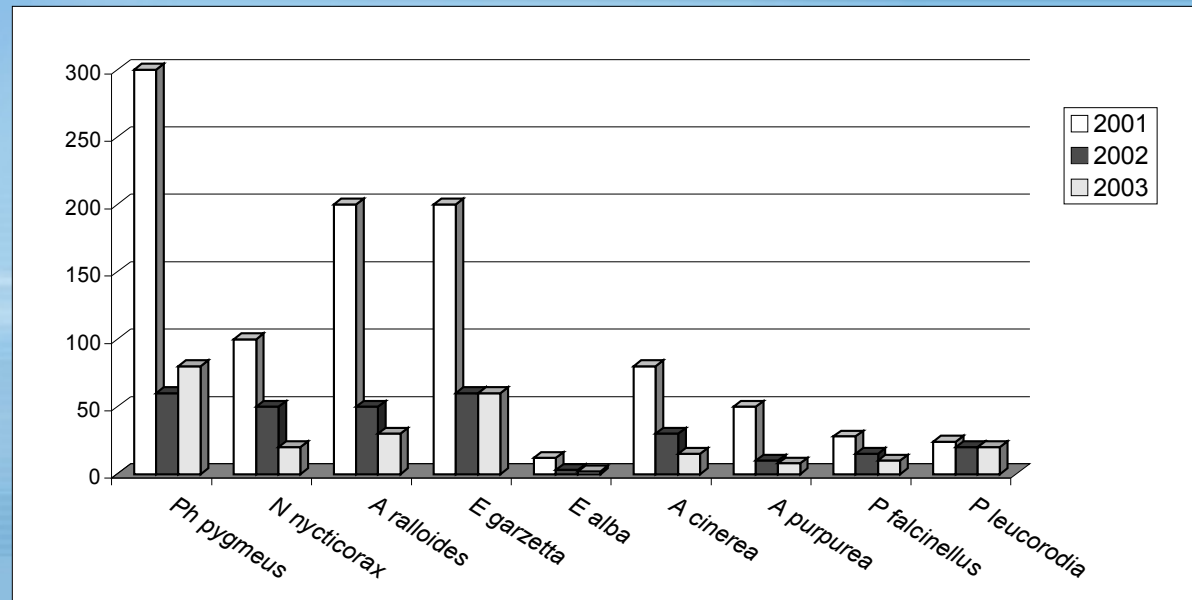
Dynamics

During the years the lake ecosystem underwent significant changes towards strong eutrophication and anthropogenically speeded-up succession. The main reasons were the interrupted connection with the Danube River (because of a dyke built in 1948) together with the pumping-out of the underground waters, as well as the agricultural changes and activities in the watershed basin. The restoration activities carried out in 1993-1994 and especially the canal which connected the lake with the Danube lead to the beginning of lake recovery.



Changes in birds

In 2002 there was a decreasing of the water column with 0,75 m compared with 2001. In the result of this we observed some changes in breeding number of some species: a reduction in the breeding pairs of Coot, Ferruginous Duck, Pochard and Mallard in 2002 in comparison with 2001. The changes we associated with the facts that 1/ in 2002 the area of water bodies, which was abundant with food and nesting resources, decreased and 2/ because these species was numerous in 2001 and the decline in 2002 was very obvious.



Monitoring

„Ecological monitoring of Srebarna Biosphere Reserve with a view to control its condition and take science-grounded managing decisions.“

Every year the scientists from Central Laboratory of General Ecology – Bulgarian Academy of Science keep track of: water level, water quality, production and destruction processes, phytoplankton and zooplankton communities, microbe communities, zoobenthos, vegetation community, fishes and birds. The project is funded by Bulgarian Ministry of Environment and Waters.

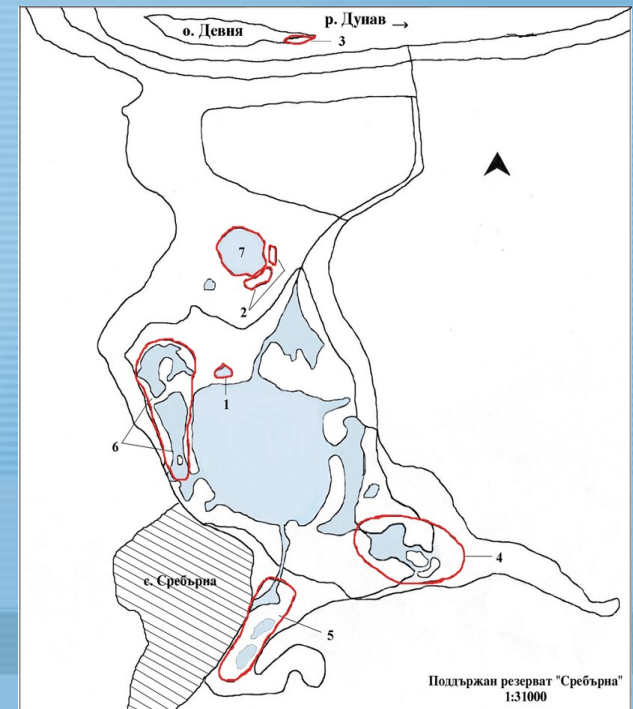


Map of Srebarna Reserve

Bird monitoring

In breeding period the monitor bird species are Great crested Grebe (*Podiceps cristatus*), Coot (*Fulica atra*), Moorhen (*Gallinula chloropus*) and Marsh Harrier (*Circus aeruginosus*), Little Bittern (*Ixobrychus minutus*), Eurasian Bittern (*Botaurus stellaris*), Savi`s Warbler (*Locustella luscinioides*) and Great Reed Warbler (*Acrocephalus arundinaceus*). Also the colony of Dalmatian Pelican is studied since 1954.

In the winter we monitor all wetland bird species in the reserve. Commonly the variations in the number of breeding and wintering bird species are due to the alteration of annual hydrological regime.



Management Plan

In 1998, the Central Laboratory of General Ecology began the research work for preparation of Management Plan of Srebarna Reserve. This is realized with the financial support of Ramsar Convention for the protection of wetlands and National Award “Henri Ford” (1999) for the protection of world natural and cultural heritage. In 2001, the Management Plan was endorsed from the Ministry of Environment and Waters. The philosophy of the present Plan rests on the wise use of the Reserve's natural resources, combined with guaranteed and long-term conservation of its biodiversity.

In this way, the local people will get fresh opportunities to increase and improve their prosperity and, on the other hand, the lake's wildlife will be preserved for future generations (Srebarna Reserve Management Plan, 2001).



Implementation of the Management Plan

Some of the projects proposed in the Management Plan was accomplished:

- Project 1.2.1: Remodelling and repair of the two sluices built on the connecting canal in 1994;
- Project 4.3.1: Conservation activities for the protection of the Dalmatian Pelican;
- Project 5.1.1: Building a sand- and gravel-surfaced panorama path along the western edge of the Reserve.
- Project 5.2.1: Allocation of sites for licensed angling according to a procedure established by the Regional Inspectorate of Environment and Water;
- Project 6.1.1: Spatial renewal of the area around the entrance of the reserve: sign-posting of hiking trails around the Reserve, including an eco-path on the high western bank.
- Project 7.2.1: Establishment of a system for long-term monitoring of ecosystems. Conduct of the monitoring.

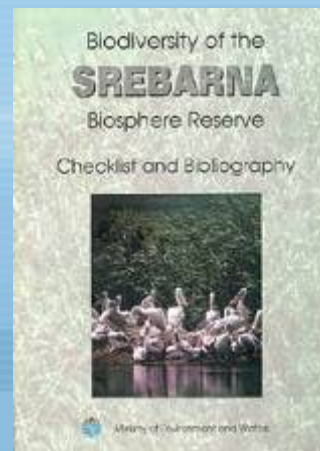
Recent Projects:

Complex monitoring of the Srebarna Lake Biosphere Reserve in support of the decision-making and management.

Development and implementation of the Management Plan for the Srebarna Lake Biosphere Reserve (Ramsar) (1999 – 2000).

Biotope distribution and communities of terrestrial small mammals in the region of the Srebarna Biosphere Reserve (2004 - 2006).

Interrelationship models of neighboring lotic and lentic ecosystems in the processes of recovery and development of aquatic communities in wetlands of the Lower Danube terrace (2005 - 2007).



Thank you for your attention!

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