

Additional material

Noteworthy Flora

More than 55 plants species occurs on Belene Islands Complex. A specific characteristic of the island trees and bushes vegetation is its poor species composition compared to that along the banks.

Of the totally 55 species only 8 are common for the islands and the high riverside terraces, 18 species grow on the islands only. The plant species listed in Bulgarian Red Data Book are *Nymphaea alba* (EN), *Nuphar lutea* (EN), *Marsilea quadrifolia* (CR), *Nymphoides peltata* (EN), *Trapa natans* (EN). The largest Bulgarian stand *Nymphaea alba* is located in Dulova Bara Marsh, and the largest area of *Nymphoides peltata* occurs in Peschina Marsh. The rare *Marsilea quadrifolia* grows there, and the *Leucojum aestivum* still rarely occurs in the eastern part of the island (Michev, 1993).

Physical features of the site:

- Hydrogeology and hydrology

During the period of spring high water level of Danube river lower parts of the island are flooded. The flooding usually starts in March and continues until June when the water level of Danube reaches its maximum. The duration of the inundation of the islands depends on the elevation of the land (see table 1). The area with elevation up to 2 meters above average river level are long term inundated.

Table 1. A duration of the inundation of the Danube islands in Svistov region (Tzanov, 1992)

Meteorological station	On kilometre of Danube	Average Danube level / sm.	Water level above the average Danube level / m.					
			0	+1	+2	+3	+4	+5
			Average duration of inundation (days)					
Svistov	554.3	357	179	117	61	24	6	0

There are three large marshes in the Belene Island - Peschina, Martvoto and Dulova bara. They drain into the river trough a canal. Through the same canal water from the river penetrate into the marshes during the period of high water levels and inundates surrounding meadows and woodlands.

The water level of the marshes depends on Danube water level and underground waters as well. The depth of the marshes is between 1 and 2.5 m at high spring water levels. During the summer they gradually become shallow and often totally dry up. During the winter, in January and February marshes often freeze. In the beginning of seventies was built the “Iron Gate” Dam in Serbia, which influence on the downstream water level of Danube. In 1970 the island was separated from the Danube with an embankment. At the end of the canal was building a sluice, allowing regulation of the water level in the marshes. Small dikes were build between the marshes separated them one from another. In the beginning of 1980 a drainage system with 3 pumping stations was build and start to operate. The water level is maintained very low (0.5 – 0.6 m. depth in maximum) and the marshes dry up every year, usually in the middle of August. This has resulted in the fast overgrowing of the banks with rush, reed and willows, so that presently they cover more than 1/3 of the total area of the

marshes.

Social and cultural values:

Until 1947 the area was used by local people for cattle grazing, fishery, and forestry (very restrict). The cattle grazing was possible only during the dry period of the year. Since 1948 the island has been used as a state prison. Due to the human impact the area lost its socio-economic value and a significant part of its ecological value. At present we can see the loss of economically valuable natural resources. In 1989 the total fish yield from the Danube amounted to 360 tonnes only, three times less than the fish caught in the forties and fifties. The reason for this is the destruction of the shallow waters and marshy areas, where the fish bred, including marshes on Belene island.

The disappearance of the habitats of the *Leucojum aestivum* is causing losses running into thousands of dollars from the inability to produce medicine Nivalin, which was discovered in Bulgaria and which is known world-wide. No special investigation on fishery production of the island and use of *Leucojum aestivum* has been done. At present the plantation and timber activity on the island provides only 6% of the timber production along the Danube, including islands, but this activity has a high negative impact on the ecosystem.