

Additional Material

Ecosystem services

Social values

Labudovo okno and the entire area of the Deliblatska peščara Sands offer exquisite possibilities for satisfaction of social and cultural necessities of inhabitants. Comparative advantages for development of various activities, which are not opposed to prescribed regimes and measures of protection, are still not entirely utilized.

Owing to its specific nature assets, this area offers possibilities for development of tourism, particularly ecological tourism – bird watching during their migration, familiarization with rare plants and their communities, etc. The area of the Danube, the Nera and the Karaš are ideal for nautical tourism and sport fishing, while surrounding meadows and pastures are suitable for long walks through nature, bicycle and horse riding and other types of open space recreation. To develop such activities it would be necessary to animate local population and to promote rural tourism, as well as to establish adequate infrastructure.

Both Labudovo okno and Deliblatska peščara Sands attract scientist from different scientific disciplines (biologists, ecologists, geographers, hydrologists, forester etc.) for a very long time. More than 600 published bibliographical units represent the result of the previous research. This area is used for field courses for students of biological and geographic disciplines and forestry, as well as for the realisation of various research and voluntary work camps. Ecological programmes from the NGO sector, as well as international voluntary camps should be intensified in the area of Labudovo okno.

In regard to agriculture, this area provides ideal conditions for production of healthy food, for which there are certain initiatives, but this activity is still not functional. Education of the local population has not been carried out systematically and it was limited to work with some local residents that were directly involved in usage or protection of the area of Podunavlje. Fishery is certainly the most developed activity, but there are some problems regarding the control of illegal fishing. Cattle grazing and usage of grass are primarily developed in open areas near the localities Dubovački rit and Stevanove ravnice towards the east, but nowadays their intensity is far below the capacity of the existing pastures. These activities are of essential importance for conservation of specific habitats significant for the survival of rare and endangered species of mammals (lesser mole rat, European souslik), birds (birds of prey, waterbirds) and other groups of animals and plants.

Neither ecological programmes from the NGO sector nor international voluntary camps have not been ever carried out in this part of the Special Nature Reserve "Deliblatska peščara".

Following a trial excavation, an archaeological find was discovered at the location Stevanove ravnice, in scope of the Ramsar area, and its further research is under way.

Current scientific research and facilities:

The Deliblatska peščara Sands, together with adjoining part of the Danube, represented and represents an exceptional scientific base, which is proved by numerous published research papers.

The contents of the scientific research in the protected area are primarily determined with characteristics and diversity of biota. General trends of scientific research are directed toward monitoring of nature assets, particularly of rare and endangered species and their ecosystems, first of all in order to propose adequate measures of protection and sustainable development of the area.

Although in the past forestry was the primary area of research, nowadays research of particular groups of flora and fauna (Banat peony, marshy/swampy and aquatic vegetation, permanent monitoring of bird migration, imperial eagle, small mammals) is also conducted, as well as monitoring of grassland revitalisation and analyses of post-fire community successions.

Current communications, education and public awareness (CEPA) activities related to or benefiting the site:

Taking into account all nature assets and scientific significance of this area, it is evident that it has an outstanding significance for conducting educational activities. Education in form of field courses is already included in teaching plans of faculties of biology in Novi Sad and Belgrade, geography in Novi Sad and forestry in Belgrade.

The CEPA activities can also be realised through organised visits of smaller groups from elementary and secondary schools. It is particularly important that student of natural sciences (biologists, forestry engineers, agricultural engineers) become acquainted with such unique and extremely vulnerable ecosystems and their functioning.

These activities represent a form of investment into future aimed at creation of high level of awareness of the necessity of adequate and hospitable relationship toward a natural heritage, and they should have priority in conservation programmes.

Planned and regular activities on education of the local population and potential users, aimed at improvement and better usage of the protected area, coordinated with its basic purpose, are conducted regularly, as well as activities on adequate promotion of existing nature assets as developmental potentials of the Ramsar side and its surroundings.

All these activities are improved through:

- organisation of expert lectures on the protected area;
- presentation of the protected area through mass media (radio, television);
- preparation and publishing of promotional material about the protected area through posters, brochures, etc.

The area of Podunavlje with the Deliblatska peščara Sands represents an outstanding scientific base. Special interest of scientist and experts from various fields for this area should be encouraged and used in future, through a coordinated planning of scientific research, the results of which should give answers to many questions of fundamental scientific interest, as well as directives and practical solutions for future management of the protected area. The area of the Deliblatska peščara Sands together with the Danube has a particular significance as a base for realisation of educational activities as well.

The fact that the local inhabitants are insufficiently informed represents a significant hazardous factor both for natural and human-made assets, as well as their low awareness of the uniqueness of the natural values of national and international significance, and the lack of opportunity to take part in management of the protected area. Such situation is caused by previous incorrect policy of management and usage – once introduced ban of grazing, and later the construction of a fence around the protected area, among other things. Although basically the process of problem genesis belongs to the past and the process of solving problems to the future, it is of essential importance to involve the local population in protection and development of the Special Nature Reserve "Deliblatska peščara" through planned actions, especially since this protected area is nominated for becoming a part of the international ecological network, which will in the first place promote environmental protection and sustainable development.

Current recreational and tourism:

Tourism, primarily in the form of planned and organized special so-called ecological tourism, represents a significant potential for sustainable development of this part of the Danube catchment area and the Deliblatska peščara Sands as its hinterland. It should be especially taken into account that this part of the region of Podunavlje represents one of the last oases of preserved environment with traditional ways of living of its inhabitants and without any large infrastructure objects. In the same time, this area represents a very important and significant biological diversity centre in this region, and one of the most important and particular bird habitats in Serbia. It is a unique migratory station for many migratory bird species, and a habitat of very rare plant and animal species that can be seen only here. This area has an outstanding tourist potential that still has to be adequately valorised and set into function. Previous usage of this area was mainly limited to hunting of waterfowl and large game animals and sport fishing, as well as occasional visits by mountaineers and individual nature lovers. The only large scale visits by tourists and groups of pupils are present at the picnic grounds of Devojački bunar, in the north-western part of the Deliblatska peščara Sands, where the traditional gathering of beekeepers is also held. Art colonies are also occasionally organised in surrounding villages.

Since this area has many attractive landscapes, it is often used for movie and music video shooting, which is not accompanied with charging adequate fees for usage of a protected nature asset.

The contact zone of the Deliblatska peščara Sands and the Danube, and the mighty river flooding over swamps and marshes, offer specific possibilities for the development of tourism (bird watching and photography, experience

of spring and autumn migration of waterbirds, hunting and fishing, nautical tourism).

Nature tourist motifs are highly ranked in tourist valorisation of the Deliblatska peščara Sands, and special nature assets even higher, which is an indicator of great attractiveness and rarity of the area. Anthropogenous motifs are lower ranked, since all used criteria designate them as potential values. Therefore, investments into tourist equipment, with adequate promotional activities, should contribute to recognition of tourism as one of the basic activities in the future development, coordinated with conservation of nature assets.

Threat and responses

Changes in the qualitative and quantitative structure of the environment of the Deliblatska peščara Sands, caused by in essence positive efforts of man to prevent or at least limit the aeolian erosion, today have negative effects on natural ecosystems.

In functional connection with the previous statement is to recognize the lack of grazing as one of the most important hazardous factors for the most valuable attributes of the protected area. The "banishment" of the cattle from the former pastures within the Special Nature Reserve in the past caused overgrowing of the steppe pastures with shrubby vegetation and, in some areas, irreversible loss of habitats of natural rarities. Within the complex functioning of the existing ecosystems, the loss of the steppe is followed by habitat reduction for particular plant species, as well as animals, from invertebrates to European souslik and imperial eagle.

The existing roads, apart from their positive role in connecting surrounding settlements, represent an important hazardous factor for nature assets, regarding that they run across habitats of terrestrial fauna and "tear" the natural unity of the Deliblatska peščara Sands.

Poaching, traditionally present in this area, also represents one of the hazardous factors, both regarding game and breeding species and species that are natural rarities, not only existing but potential as well – the first recorded specimen of lynx in recent times in the Deliblatska peščara Sands has become a victim of illegal hunting. Illegal hunting of waterbirds and illegal fishing represent another problem. Uncontrolled collecting of medicinal plants is also present nowadays.

The number of uncontrolled waste depots is rising, not only on the outskirts of the Deliblatska peščara Sands, but along the asphalt road as well, which represents a hazardous factor both for landscapes and for the indigenous flora and fauna. Uncontrolled borrow pits of sand and loess, more significantly than mere unattractive appearance also have negative effects on important loess profiles – open pages of the geological history book of this area. Apart from taking measures of providing information (in form of tables), control and penalization, it is necessary to provide adequate education and advertising as well.

Unregulated building represents one of the major hazardous factors in this area, not only through degradation of landscapes and habitats of species that are natural rarities, but through increased threat of poaching, formation of uncontrolled waste depots and fire breakouts as well. Building has particularly negative effects on the endangered area of the Ramsar site in vicinity of Dubovački rit, since the line of weekend houses completely encircles the flood zone of the swamp and disconnects it from the main current of the Danube.

Although tourism and recreation are not intensive activities in the area of the Deliblatska peščara Sands at present, with the exception of the Danube and Devojački bunar complex, they may be put at risk if they are not planned and realized as a function of the projected conservation and development of the entire protected area and in a manner that is directed through prescribed regimes and measures. Present insufficient tourist-recreational usage of the area and deficient planning of this important developmental activity, offer possibilities for adequate planning and realisation of future actions.

The research of the water-bearing layers along the Danube is currently under way, but the general opinion is that the construction of extraction water wells and commercial exploitation of water from phreatic, i.e. first aquifer, should be prohibited.

a) in the surrounding area:

Main factors influencing ecological character in surrounding area are agriculture, irrigation, forestry, illegal hunting, water pollution, infrastructure and unappropriate management of grasslands.

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