

## **GEOGRAPHIC, LANDSCAPE AND OTHER NATURAL CHARACTERISTICS OF BELGRADE AS THE BASIS FOR DEVELOPMENT OF TOURISM**

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### **Abstract**

Belgrade - the capital city of Serbia enjoys an excellent geographic position thanks to its location at the confluence of two international rivers (the Danube and the Sava) and the vicinity of surrounding hills, a home to the immensely rich flora. Unlike other European cities situated on the banks of the Danube and Sava Rivers, which extensively exploit the benefits of their highly favourable location, Belgrade has not yet fully realised the

potentials arising from its geographic position. In addition to its historical and cultural attributes, Belgrade's natural and geographic characteristics, among which a richness of biodiversity occupies a special position, hold a particular importance for the development of tourism. This paper presents the results of the study of different potentials for the development of tourism in the Belgrade area.

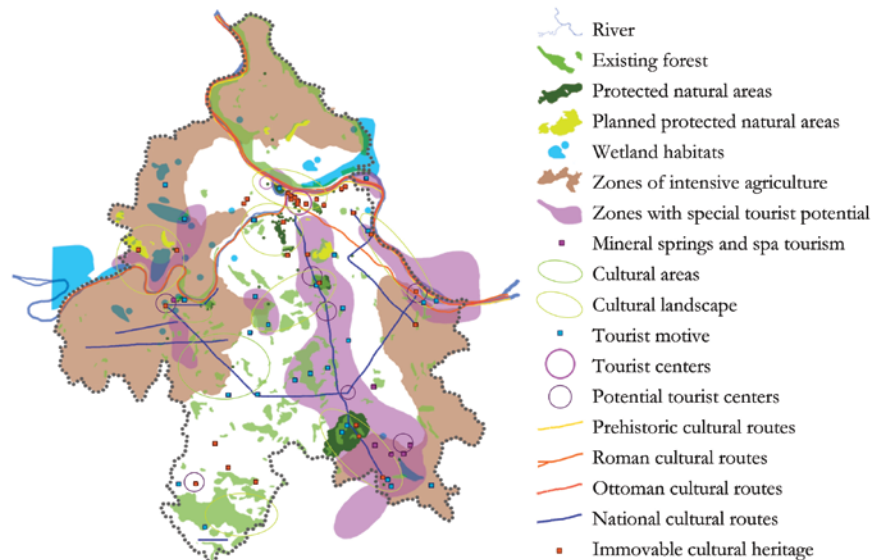
**Keywords:** *Belgrade, Serbia, tourism potentials, natural characteristic, landscape, biodiversity*

## 1. INTRODUCTION

Belgrade, the capital of Serbia, is located at 44° 48' north latitude and 20° 28' east longitude. It stretches over 360km<sup>2</sup>, while the broader city area covers 3,222km<sup>2</sup>. It is located in the Pannonian plain, on the south brim of the Pannonian basin. It is situated partly in the Balkan Peninsula and partly in the Central Europe, at the confluence of two large international rivers – the Sava and the Danube.

The first human habitats in the Belgrade area originate from 7,000 years ago, about which numerous archaeological sites, with material remains of cultures developing in the period from the Palaeolithic to Middle Ages, provide ample evidence. Belgrade, as an urban settlement, emerged in the Early Antiquity. It was founded by the Celtic tribe Scordisci, which erected a fortress on a particularly favourable topographic location with an exceptional strategic position. There are nearly 300 cultural monuments in Belgrade, out of which there are 57 monuments of exceptional and great importance, and 37 natural protected areas.

Today, Belgrade has approximately 2,000,000 inhabitants. Generally, the tourism occupies a modest place in the structure of the Serbian economy. Very attractive tourism potentials have not been sufficiently exploited.



**Figure 1.** Map of tourism and space protection  
source: The Regional Spatial Plan for the City of Belgrade Administrative Area, 2011

The Belgrade's surroundings are comprised of two different natural systems: the Pannonian lowland plains in the north and the hilly regions of Sumadija in the south. The Danube runs through 60 km of the Belgrade area, while the Sava flows through 30 km of its territory. The length of Belgrade river banks is about 200 km. These two rivers have 16 river islands, while the riverine zone, with its preserved forest and aquatic ecosystems, is very suitable for recreation and development of tourism. After certain investments in different recreational, sports and entertainment facilities, the Sava and Danube Rivers might become very interesting for development of nautical and hunting tourism in the broader city areas, which are rich in various hunting game.

## 2. STUDY RESULTS

### 2.1 Climatic characteristics

Belgrade and its surroundings are characterised by a temperate continental climate with the average annual temperature of 11,6°C and the average annual precipitation amount of 668mm. The average annual relative humidity is 70%.

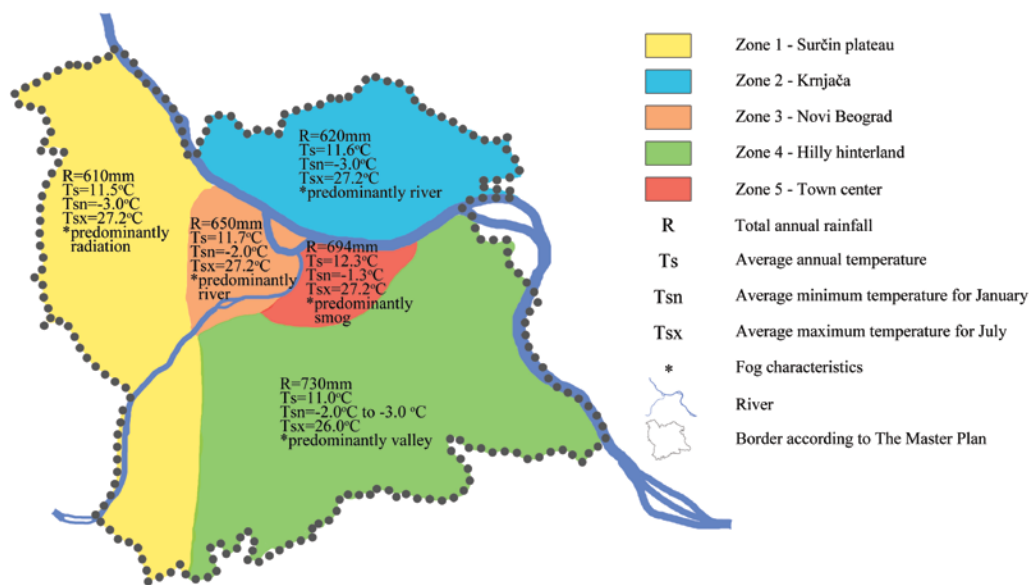


Figure 2. Map of topoclimatic zones and characteristic parameters (source: Environmental Atlas of Belgrade, 2002)

### 2.2 Vegetation and forests ecosystems

The city of Belgrade natural boundaries are located at the contact point of two large and different natural entities – the Pannonian Plain and the Balkan Peninsula, with three primary biomes (1) steppe and wooded steppe, (2) floodplain broadleaved forests, and (3) Hungarian oak and Turkey oak forests. These natural areas are quite modified by human activity and, as a result, urban, sub-urban and cultivated areas are predominant today. In the course of permanent development and expansion of the city, the natural and

agricultural ecosystems in the city peripheral areas have been substituted by urban systems.

A steppe-like vegetation, dominated by French whisk (*Chrysopogon gryllus* L.) and porcupine grass (*Stipa* sp.) (Tomic, 2004), is typical of the lower, northern part of the city area. A significant part of the low Danube area once consisted of a fan-mire environment, with numerous large marshes, river effluents, dead waters and old waters, covered by typical mire vegetation, which were transformed into a large pond every year, during the high water-level period of the Danube and Tisa Rivers. This area of Belgrade has undergone the most extensive changes in the recent past. Fens were largely drained in 1930s, and only small patches of fen-mire or marshy habitats remained of, once immense, flood terrain. The largest part of the land in this area, particularly in its northern parts, is agriculturally cultivated and nowadays represents a typical 'cultivated steppe'.

Most part of the southern area of the Belgrade region is dominated by the Hungarian oak-Turkey oak association (*Quercetum frainetto – cerris* Rud. 1949), as the native climatogeneous association (Group of authors, 2005).

Large penduculate oak forests (*Quercetum roboris* Jov. et Tom. 1980), pure or, contingent upon a site condition, mixed with European hornbeam, narrow-leafed ash, field elm, field maple and other forest tree species, used to cover the valleys and areas along the river banks in this vegetation zone.

Sessile oak (*Quercus petraea* Matt.), dominated the forest composition in dry and warm hills, at higher altitudes, forming the forest association - *Quercetum montanum* Čer. et Jov.



**Figure 3.** Forests ecosystems on mountain Avala

In small areas at higher altitudes, in shaded depressions and colder aspects of the terrain, sessile oak was replaced by beech and formed the association - *Fagetum montanum illyricum* Fuk. et Stef. 1958, of a limited surface area. The part of the region stretching along Sumadijska greda used to be entirely covered by forests, which fully justified the name (Forest Stretch) that this region of Serbia holds. The largest part of this, once forested area is now agricultural land. Oak-ash forests (*Querceto - Fraxinetum serbicum* Rud.), along with willow-poplar forests (*Populeto - Salicetum*), dominate the riverine

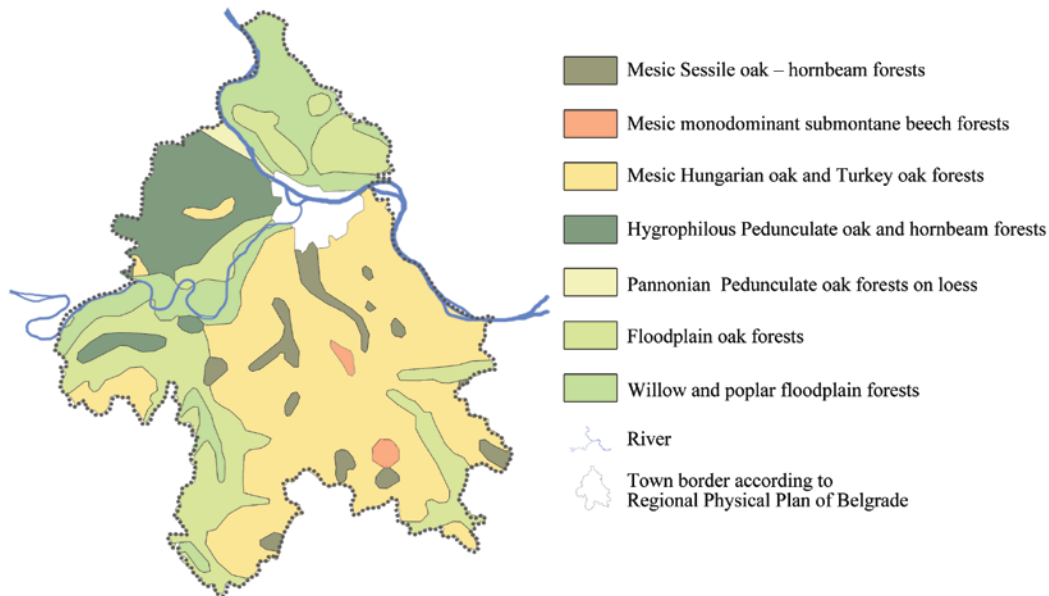


areas. Beech, oak, willow and poplar forest associations, as the native associations, were of far richer composition in terms of share of other species in all floors, and far more complex in their cenological structure.



**Figure 4.** Willow and poplar forests in riverine areas (Progarska ada)

The total surface area of Belgrade forests amounts to 35,980 ha.



**Figure 5.** Map of habitats on the City of Belgrade broader territory (source: Afforestation strategy of the Belgrade area, 2009)

### 2.3 Rare and endangered plant species

Within the existing plant resources of Belgrade forests, 16 genetically endangered autochthonous tree species have been recorded. Genetic resource of many species (wild

cherry, sweet chestnut, walnut, maple, Norway maple, aspen, black poplar, white ash, rose, common hazel, butcher's broom) is endangered due to clearing of forests, immoderate exploitation of wood mass or altered ecological conditions of the environment. Some of the endangered tree species are also important as fruit trees, whose genetic resource is endangered as a result of competition with cultivated fruits (crab apple, wild pear, etc.). Within the endangered trees, there are species with salutary or melliferous properties (white ash, crab apple, wild cherry, maple, walnut, sweet chestnut, black pine, black poplar). A particularly rare species is also recorded: common periwinkle (*Vinca minor* L.).

The areal of vascular flora is permanently decreasing on account of change of ecological conditions, clearing of forests and creation of uncontrolled landfills. Within the vascular flora of Belgrade forests, 26 endangered species were recorded, the best known among them being: white violet, yellow wood anemone, yellow-water lily, lemon balm, foxglove, green-winged orchid, etc. Within the endangered plants, there are plants important for their salutary (houseleek, lemon balm) and melliferous properties (sweet violet and lemon balm).

Fifty-three rare species were also recorded, 15 out of which fall under the category of quite rare (snowdrop, tall violet, strawberry, primrose, etc), 17 under the category of very rare (early dog violet, belladonna, yellow iris and Hungarian iris, asparagus, etc) and 21 species facing extinction (wood anemone, woolly foxglove, lily of the valley, calamus, hart's tongue fern, autumn crocus, Valerian, elecampane, wild peony, pasque flower, etc.) (Group of authors, 2007).



**Figure 6.** Some endangered plant species



**Figure 7.** Some rare plant species

## **2.4 Fauna – potentials for recreational hunting and hunting tourism**

A great diversity of the biotope of Belgrade's urban forests determined the great diversity of fauna that inhabit them. Large game is present only in form of certain rare types, which occur only occasionally. In addition to autochthonous species, the deer and the boar, allochthonous-introduced species, the fallow deer and the mouflon, are also kept in hunting grounds.

Mostly large game is kept in fenced hunting grounds, where, as a result of applied breeding measures, the population density of kept species is far higher than in open hunting grounds. In all fenced hunting grounds, there are other types of game as well, present in limited numbers: fox, badger, polecat, wild cat, European pine marten, large and small ferret, along with a large number of birds: pheasant, partridge, wood pigeon, stock dove and rock dove, Eurasian woodcock, common kestrel, northern goshawk and other.

In addition to fenced, there are also open hunting grounds, partly located within the Belgrade forests, and partly in agricultural areas, which determines the type of species that inhabit them.

In addition to primary species, other types of game are also present in open hunting grounds: fox, badger, polecat, wild cat, European pine marten, large and small ferret, along with a large number of birds: wood pigeon, stock dove and rock dove, Eurasian woodcock, common kestrel, northern goshawk and other.

Small game is more numerous both in terms of number of species and number of animals within a species. Hares, which were the most represented hunting species in the earlier period, were significantly reduced on account of intensive hunting and lack of necessary measures. Squirrels, which live in parks, orchards and small woods are very frequent. The ground squirrel can be found in the steppe environment across the Sava and the Danube. The lesser mole rat lives on the entire territory of the broader Belgrade area, but in small numbers. The European water vole lives in the vicinity of aquatic areas, but also penetrates into gardens and orchards. The hamster inhabits all living environments, particularly the areas across the rivers Sava and Danube. Pole cats can be found in all forested areas, whereas wolves can be occasionally observed passing through the areas in the city boundaries. The fox can be found in all areas outside the urban zone, while the European pine marten lives in large forest areas. The large and small ferret can be frequently found in fields and forests, while the polecat and the badger live in forests and in the brinks of forests.

A broader city area is inhabited by a large number of birds. They include the great bustard, grey partridge, pheasant, partridge, wood pigeon, stock dove and rock dove. The turtle dove and collared dove, which live in urban environments within the city area, are very common. The common snipe, Eurasian woodcock and great snipe, lapwing, black tern and common tern live in non-urban areas. The black-headed and herring gull commonly nest and live in the vicinity of water. The little grebe and great-crested grebe are quite common in fish ponds and all still waters, while the red-necked grebe, black-necked grebe and great northern diver can only be very rarely observed during winter.

Various types of geese, which are migration birds, come to the Belgrade area to spend winter. Wild ducks, common teal, and ferruginous duck are quite common in marshes, fish ponds and running waters, while eider duck is far more rare. Pochards are quite rare, while common pochard, wigeon, pintail, shoveller, tufted duck and goldeneye can be



found. Shelduck and ruddy shelduck could once be seen in winter, while presently, unfortunately, they are far more rare. Goosander and smew can be seen in winter in the broader Belgrade area, but very rarely. The white stork is common, while the black storks is a rare species, which looks for a quiet forest habitats.

The grey heron, purple heron and little egret are common inhabitants of marshy areas. The great egret represents a rarity. The little bittern and the night heron nest in willow grows and reed beds; they are migration birds, which fly to the southern areas in autumn.

The peregrine falcon and saker falcon are rarely found in the area of city forests, while the sparrowhawk, common kestrel and red-footed falcon are far more common. The kestrel remains in Belgrade throughout a year, where it also makes nests. The imperial eagle is a rare species, which usually makes nests at larger mountains, but it can be occasionally seen in the Belgrade area. The booted eagle is a rare species that can occasionally be seen at Avala, Kosutnjak and Lipovica, while the white-tailed eagle, although a rarity in Serbia, still occasionally nests in Danube and Sava river islands. The osprey is a rare species generally, as it is in the Belgrade area; it builds nests on tall trees near rivers in quiet spots far from the city. The goshawk is a forest species, lives in the entire city area. The buzzard spends unfavourable winter seasons in Belgrade. The sparrowhawk is not a rarity in Serbia; however, in the Belgrade area it can be found only in coniferous forests of the mountain Avala.

On the other hand, the levant sparrowhawk is very common. The marsh harrier and the montagu's harrier commonly build nest in marshes and fens along the Sava and Danube, while the northern harrier and the pallid harrier are exceptionally rare in the Belgrade's surroundings. The red kite and the black kite can be observed along the valleys of Sava and Danube. The eagle-owl and the short-eared owl were more numerous in the past, while today they can be found only in northern parts of the broader city area.

A bird that typically inhabits foot of the mountain and plains – the little owl lives in willow groves and flood forest remains, while the tawny owl lives only in better preserved and larger forests. The raven can be rarely observed in the Belgrade area. The hooded crow and the rook are very numerous and common in the entire city area. Jackdaws and magpies are species typical of fields, meadows, groves, shrubs, but also of smaller settlements. The Eurasian jay is a species that inhabits oak forests in the hills in the entire city area. The great spotted woodpecker and the Syrian woodpecker live and make nests in parks and groves. The common tit lives in Belgrade throughout a year, while the blue tit, the coal tit, the marsh tit and the long-tailed tit only spend winters in Belgrade.

The common blackbird, the common starling, the finch and the sparrow are very numerous and live in Belgrade permanently throughout a year. In addition to fenced and open hunting grounds, the Republic of Serbia Spatial Plan has also envisaged a Game Park on the territory of Belgrade (Group of authors, 2008).

The Sava and Danube riverine area as a tourism potential of special importance The total surface area of the broader Sava and Danube riverine area amounts to 16,950 ha, while the inner riverine area covers the surface area of 5,587 ha, with the total length of river banks of 153km (Group of authors, 2012).





**Figure 8.** Danube riverine area

The average width of Danube in Belgrade is about 550m; the average width of Sava in Belgrade is 200-300m, while in the remaining part beyond the traffic corridor, the Danube's average width is 350m, and the average Sava's width is 100-200m. Over 100 boat restaurants and 900 boat houses are moored along the river banks of Sava and Danube, while over 3,000 boats are kept in more than 20 moorings. There are over 600 stilt houses, while a large number of boats, dredgers, tugboats, barges and other vessels of Belgrade companies, along with around ten pontoons or stairways for access to boats, are anchored or moored.

The Sava and Danube riverbanks are used for river traffic, mooring vessels, marinas, exploitation of river bed materials, sport, recreation, relaxation (boat restaurants and water sports, boat houses, etc.).



**Figure 9.** Port of Belgrade

Belgrade city areas of a primary tourism value are the Belgrade and Zemun old towns, economic and recreational zones; however, their value, as well as new potentials and needs, is closely connected to the Sava and Danube riverine areas.



**Figure 10.** Belgrade fortress (15th century) - detail



**Figure 11.** Zemun – Gardos with the Sibirjanin Janko's Tower (19th century)

## **2.5 The Danube tourism potentials**

Like the other tourism potentials, the potentials that the Danube provides in this area are insufficiently exploited.

The international regional and cross-border co-operation can perform a significant role in ensuring a faster realisation of sustainable development and sustainable use of natural and cultural-historical resources, which has been proved by a previous highly successful co-operation with Romania in the framework of the 'Djerdap' National Park, stretching

along the right bank of Danube, downstream from the town of Golubac, and covering nearly 100km of the Danube's course through the Djerdap Gorge.



**Figure 12.** The Djerdap Gorge

The Djerdap Gorge, the longest and largest gorge in Europe, traverses the South Carpatian strip from the town of Golubac to Kladovo and connects the Pannonian and Vlasko-Pontijski Basin. Four gorges and three basins, dividing them, represent separate entities. The Kazan Gorge, also known as the 'Gates of Europe', is particularly attractive. In this strait, the Danube narrows only to 180 m, while, at the same time, it reaches its greatest depth of 90 m.

A complex network of gorges, canyons and deep basins and a very favourable 'Djerdap climate' enabled preservation, during the ice age, of numerous specimens of plant and animal world from the ancient warm tertiary. As a result, specimens of diverse, ancient flora, largely extinct in the northern parts of the continent, can be found in the 'Djerdap' Gorge, which is a sort of natural science museum, very attractive for a special type of tourism.

At the same time, along with the abundance of natural resources, cultural-historical heritage of this region represents an immensely valuable treasure. Numerous archaeological monuments and sites have been discovered in the course of a several decade long systematic research. Their study has not yet been finished, and it is expected to continue throughout the following decades. This is where a large potential for cross-border projects in the framework of the EU neighbourhood programme lies.

As a large river, the Danube has been attractive to people since ancient times. Different civilisations were succeeding each other, leaving indelible marks behind them. As early as 8,000 years ago, a magnificent culture of the prehistoric man was founded and survived for several centuries along this section of Danube. Many European and Asian peoples journeyed across these regions in the course of their migrations and military expeditions.



During their military campaigns, Roman Emperors left numerous testimonies to their journeys and presence in the Djerdap region, including Viminacium, situated at the confluence of the Mlava and Danube rivers; a world-unique bridge over the Danube, built in the period of the Emperor Trajan; a Trajan's stone plaque ('Tabula Traiana'), which is located at the very end of the Djerdap Gorge and a Roman road carved into the rocky cliffs of Kazan.



**Figure 13.** Trajan's stone plaque ('Tabula Traiana')

The remains of the Roman fortress Diana at the town of Karatas, situated on the left bank of Danube, about two or three kilometres downstream from the hydro-power plant 'Djerdap I', also testify to the wealth and power of the Roman Empire.



**Figure 14.** The Roman castrum - Fortress Diana



The remains of a several century long Ottoman presence in this region are best preserved in the fortress Fetislam near Kladovo, and in many toponyms, such as Djerdap, Tausan, Ali Begov potok, Kazan, Tekija and other.



**Figure 15.** Fetislam Fortress near Kladovo (16-17th century)

The beginning of the construction of the hydro-energy system Djerdap I, thanks to the archaeological research conducted in the period from 1964 to 1971, enabled gaining a new understanding of life and cultural migrations of people in this region. Evidence is unveiled on a long and very rich life of the Djerdap Gorge people. The best proof for that was a discovery of a new prehistoric culture, named after the eponymous locality - 'Culture of Lepenski Vir'. 'Lepenski vir' is not only the principal cultural monument in the area of the 'Djerdap' National Park, but it is also considered one of the most important prehistoric localities in Europe.



**Figure 16.** Statue of Progenitor - female found on locality Lepenski vir

Today, out of all researched archaeological localities on the territory of the 'Djerdap' National Park, only Golubacki Grad (Golubac Town), Lepenski Vir, Trajan's Plaque and Diana at Karatas can be seen. Golubacki Grad and Diana were located above the submersion level, and their research is continued even today. 'Lepenski Vir' and the Trajan's Plaque were dislocated and preserved, and can be visited even today, while the other archaeological localities were submerged and became inaccessible. With its dominant position at the very entrance to the Djerdap Gorge, towers and mighty walls, Golubacki Grad testifies to the power, construction skills and the knowledge of medieval Serbian monarchs and builders.



**Figure 17.** Golubacki Grad

The reconstruction of the cultural corridor, under the title 'Routes of Roman Emperors', which connects different parts of Serbia and reveals the richness of cultural heritage (such as imperial palaces near Gamzigrad, Sirmium, Singidunum, Trajan's route to Danube, Viminacium, Mediana and Naissus), represents a potentially very attractive tourism offering.



**Figure 18.** Cultural-Antiquity corridor through Serbia ‘Routes of Roman Emperors’

According to the Republic of Serbia Strategy of Spatial Development 2009-2013-2020, the area along the Danube Basin has a large development and tourism-recreational potential for the Republic of Serbia. As a result, ‘Belgrade on rivers’ represents a principal priority among completed or initiated tourism projects. When it comes to the priorities concerning new tourism areas, out of 11 tourism priorities in Serbia, 3 of them are directly related to the Danube and Podunavlje (the Danube waterway corridor; the destination Djerdap; and the destination Gornje Podunavlje).

With respect to the Danube waterway corridor, important tourism target groups are passengers on river boat cruisers. According to the data of the Belgrade Tourism Organisation, on average 400 cruisers a year, with approximately 50,000 passengers, stop in Belgrade. A boat tours are organised in such a way that several Central European cities are visited, with overnight stay at a boat itself, while the period of stay in one place does not exceed three days. The Danube is a favourite for river cruises. The Sava Port is the only port intended for boat cruisers.

Another interesting group of tourists are the cyclists, as the Fourth Stage of ‘The Danube cycling route’ (Donauradweg), which starts in Budapest and ends at the Black Sea, 1,670km long, is also run through Serbia.





**Figure 19.** Danube cycling route

Until September 2009, the eco counter at Donji Milanovac had numbered more than 3,500 cyclists.

## **2.6 Danube ecological potential**

The Danube delta has been a UNESCO protected area since 1991, while the Danube region includes several natural reserves and protected areas, registered in the framework of the Natura 2000 Programme. The Danube and the Danube delta have unique and fragile ecosystems, which are the habitats to rare species of fish, birds, plants, butterflies, etc, endangered by pollution.

Pursuant to the Ramsar Convention on protection of water habitats, nine protected areas acquired the Ramsar area status, of the total surface area of 55,627 ha.



An Important Bird Area (IBA), and an Important Plant (IPA) and a Prime Butterfly Area (PBA) are, among others, Gornje Podunavlje and Djerdap.

By the signature of the Declaration of Vienna in June 2009, the Danube River Network of Protected Areas was established. This partnership primarily develops co-operation, co-ordination, consultations and strengthening of relationships between national administrations of Danube countries.

## **2.7 Directions for further development and use of Sava and Danube riverine areas in the Belgrade region**

A development of the City of Belgrade is oriented towards a further improvement of natural and living environment. Rivers and large green spaces in the very inner city area must be protected.

A road access and parking places in the immediate vicinity of river banks should be provided, and a prohibition of access to paths and embankments for vehicles should be imposed. An uninterrupted pedestrian and cycling path are envisaged, along with a river transport connection to neighbouring towns.



**Figure 20.** The existing cycling path around the Sava Lake

Belgrade also has a potential for development of water traffic, which could gain more importance in future, while the building of two bridges, which is in its final phase, along with the construction of the bypass around the city, will contribute to development of road transport. In line with the above-mentioned is the city's orientation to develop riverine areas and create possibility for improvement of water transport.



**Figure 21.** Bridge at Ada Ciganlija (built in 2012)

The Sava and Danube banks, river islands, the marina and nautical tourism are becoming a specific mark of the city. A special central-Belgrade motif is the confluence of the Sava and Danube rivers and a river island Veliko Ratno Ostrvo with its natural, visual, cultural, ecological and bathing character, representing one of the ‘symbols’ of Belgrade. The 2021 Belgrade General Plan envisages that the entire area of Usce (the confluence) becomes a large aquatorium, suitable for development of water sports, recreation and tourism.



**Figure 22.** The confluence of the Sava and Danube Rivers and Veliko Ratno Ostrvo, seen from Kalemegdan Fortress

By a planned construction of the canal on the left bank of Danube, and creation of new river islands and water areas, a new tourism motif will be introduced with recreation as its primary purpose. In addition to marinas, building of new accommodation facilities is also planned.

By the 2021 Belgrade General Development Plan, some of the observation points requiring protection have been clearly defined (Kalemegdan Fortress with the statue of ‘Pobednik’ at the elevation point 113.4). This is the most important Belgrade observation point, which provides the view of two classic city panoramas. The first one is the panorama of the ‘Sava Amphitheatre’, with the Orthodox Cathedral Church on the left



and the Sava River on the right, encompassing green areas of Topcider Hill, Kosutnjak and Avala. The other panorama is of the Sava confluence, and two river islands, with a view of representative and green Novi Beograd and Zemun area in the background. The next point is Zemun – Gardos (elevation point 111) – the most important observation point in the left-of-the-Sava part of the city – with a view over the Zemun’s Old Town (a monument complex) to the Danube and Belgrade behind it, and hills in the background.

In addition to the above-mentioned observation points, the Terazije terrace affords an exceptional view of Novi Beograd and bridges over the Sava River, Ada Ciganlija and farther down. In addition, Belgrade bridges provide a view of Usce, Kalemegdan and the Belgrade foreland. And finally, Milicevo Brdo (elevation point 279), gives an exceptional panorama of the Danube from the height of 200m, with a downstream view of Zemun and farther area; it also provides a south direction view, towards the surroundings of the Monastery Slanci, with a typical Sumadija-type succession of ploughed land and afforested plateaux.

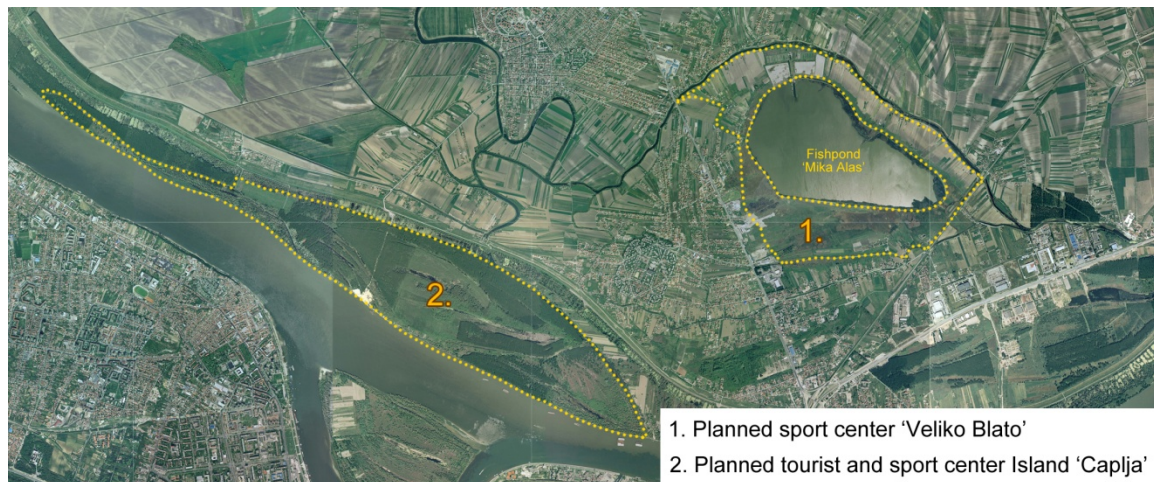


**Figure 23.** Standing points as observation spots providing view of Belgrade Rivers

### **Sport and sport facilities and complexes**

With respect to development of sports and sports activities, it is necessary to guide the development of sports centres and facilities towards the use of natural resources and their further development. This, without doubt, includes banks of rivers and lakes, and it is aimed at promoting development of water sports and recreation, and activating and developing natural resources (forests, banks of rivers, ponds and streams), with a view to developing a health-recreational and tourism function.

In total, thirty-two sports centres have been planned, with the total surface area of approximately 2,000ha. Of particular importance are specific, exceptionally large green spaces and aquatoriums – the island ‘Caplja’ (around 580ha); ‘Veliko Blato’ sports-recreational centre (about 250ha); three golf courses of the total surface area of 300ha and a new horse-racing track of about 50ha.



**Figure 24.** Planned sports facilities and complexes

Forests in the Sava and Danube riverine areas are of particular importance for activities related to a recreation in form of walking, entertainment, games, leisure, relaxation in the nature, swimming and tanning. A level of attractiveness for potential users is being increased by a careful selection of facilities, designed to be easily accessed: observation points, sandy beaches, hunting and fishing grounds, capped springs, places of historical and ethnographic importance, natural monuments, trim trails, health trails, cycling paths, national cuisine restaurants, equipped camps, etc.



**Figure 25.** Lido Beach, Zemun

In addition to recreational facilities, it is necessary to facilitate a further development of specialised outdoor sports complexes, intended for sports and competition activities not requiring especially built areas for audience, such as golf courses, shooting ranges, aquatoriums for nautical sports, etc.



Specialised sports facilities for organisation of sports competitions and sport events at a national and international level, requiring a large capacity areas for audience and complex buildings and infrastructure – aquatoriums and moorings for nautical and moto-nautical sports (rowing, kayaking, sailing, wind-surfing, water-skiing, jet-skiing), should be established through development of suitable sections of the riverine belt.



**Figure 26.** Golf course at Ada Ciganlija

Sports fishing should be planned within numerous canals in the peripheral city zone, in existing ponds, and in the open river course of the Sava and Danube Rivers. In the framework of the planned sports-recreational centre at Ada Huja, a location for a kart circuit has already been selected and its construction is in progress.



**Figure 27.** The existing kart circuit at Ada Huja

There is a possibility to establish green corridors along the Danube and Sava river banks, roads, small city watercourses and canals in the lowland parts of Belgrade. Forests

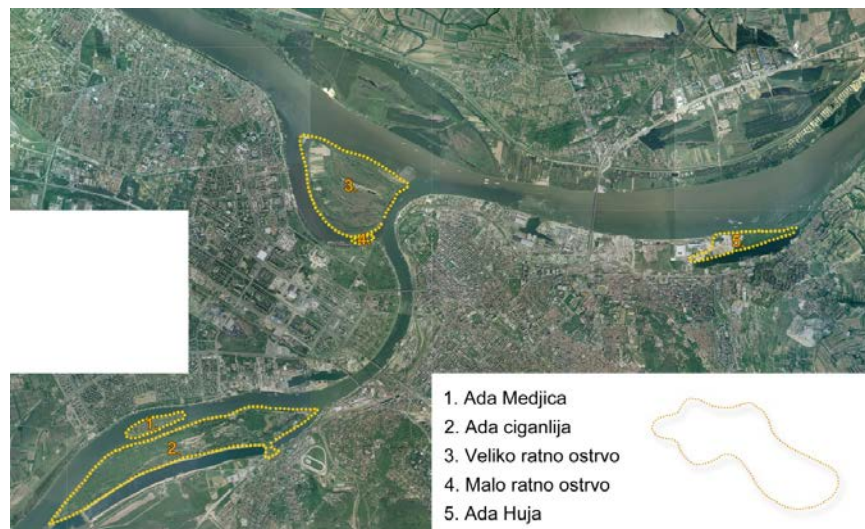
in the Danube and Sava foreland will represent important corridors in the city greenery system, providing the inflow of clean air.



**Figure 28.** Park Prijateljstva

River islands ('Ada' in Serbian) represent a special relief form, some of which are designated as the areas with natural values of importance for preservation of environment quality, previously enjoying the protection status as a reserve and/or area of exceptional features, while some have already been used as recreational areas.

When planning any type of intervention in the riverine areas, it is necessary to provide a solution for wastewater treatment, protect the existing autochthonous vegetation, envisage measures for protection and rehabilitation of existing marshes and mires, while forest and other ecosystems should be restored by means of introduction of species indigenous to current potential vegetation.



**Figure 29.** Some of the main Belgrade river islands



Marshes, mires and fens represent important biotopes for diverse flora and fauna, birds in particular. They are also important ichtiofauna hatcheries. If it is estimated that performance of certain interventions is necessary, the existing marshes, mires and fens should be preserved and protected at the largest possible scale.



**Figure 30.** Ass. Scirpo - Phragmitetum W. Koch (1926) Reed Bed Association

A public proposal on urban design, with international participation and focus on resolving relations between natural elements, visual harmony of the confluence visual features and recreational use of space and facilities.



**Figure 31.** Sava 'Amphitheatre'

About 48km of embankment and quays has been built along the Sava and Danube Rivers. Some of the quays, (the left bank of the Sava River in the confluence area), built for the purpose of creating a balanced connection between the city and the rivers, and fully integrated into riverine park greenery, have become the most valuable visual and recreational treasure.



Belgrade is already well-known for its numerous boat restaurants. About 110 boat restaurants are located along the Sava and Danube river banks, while the extension of their current purpose has been planned to include cultural (chamber theatres, galleries), tourism (cultural-entertainment manifestations, hotels), sports (recreational centres and night-clubs) and mixed purpose.



**Figure 32.** Restaurants on the Danube River in Belgrade

Numerous boat houses and stilt houses add a special charm to the riverine area. Recreational boat houses are stationed vessels of low draught, made of floating objects and not designed for frequent moving; they consist of a tanning platform and a cabin for storing equipment and a recreational stay. There are about 900 boat houses on the Danube and Sava river banks, occupying about 20km of their length. It should be taken into consideration that their uncontrolled expansion increases the endangerment of the functional, ecological and aesthetical aspects of the environment.



**Figure 33.** Boat houses and existing stilt houses in the Belgrade riverine area

Stilt houses are wooden objects of recreational purpose, located near the river banks or above the water, elevated on pillars for protection against floods. They are largely located

in the proximity of open watercourses and canals, and in the foreland in front of a defensive embankment.

### 3. CONCLUSION

The results of conducted studies proved that Belgrade - the capital city of Serbia, thanks to its excellent geographic position at the confluence of two international rivers (Danube and Sava), and the vicinity of surrounding hilly landscapes with an immense richness of flora and fauna, has exceptional potentials for development of tourism. Historical and cultural heritage, without doubt, provides a significant contribution to the appeal of the city, accompanied by the present intensive entertainment and cultural life.

In a very near future, Belgrade could join cities Bratislava, Vienna, and Budapest to form a common '4B' tourist route.

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