

# Sava River Basin Management Plan

Background paper No. 8

## Protected areas in the Sava River Basin

March 2013

Supported by the





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# 1 Introduction

This background paper is focusing on the Protected areas (PA) with respect to the Water Framework Directive (WFD) requirements and the description of current situation regarding the Register of protected areas in the Sava River Basin (RB) as well as on identification of the main pressure on PA.

Basic precondition for ensuring preparation of the proper register of protected areas and setting the associated objectives is transposition of related EU legislation into the national legislation.

WFD and other related legal documents consider separately protected areas because they need extra protection for conservation of habitats and/or species, or they are distinguished as important to be protected based on other reasons covered by the Community legislation (e.g. abstraction of drinking water, bathing waters etc. – the WFD Article 6).

Within the Sava River Basin the related national legislation in non-EU countries is not fully harmonized with the EU standards. Slovenia delineated all areas identified in WFD or other related directives (2008/25/EC, Govedič et al. 2007, 92/43/EEC). The same applies in the case of Croatia (the relevant by-law on Ecological network has been ratified - NN 109/07, while the designation of NATURA 2000 sites will take place with accession of the country to the EU). In Serbia, the new by-law (Official Gazette of the RS, 102/2010) identifies the sites and regulates the issue of management and financing of Ecological network. Thus, in the case of the Sava RBMP, the modified approach in dealing with protected areas should be used, having in mind the different national standards for the delineation of protected areas.

## 2 Protected areas and the Water Framework Directive

The WFD is a fundamental tool for implementation of all water-related EU Directives, as well as a platform for coordination of activities on the realization of other Community legal instruments and global initiatives. Beside other issues, the WFD considers protected areas, as areas that need extra protection.

According to the Guidance Document No. 1 (2003), the river basin management plan for each river basin district should include the map showing any protected areas, map of the results of the monitoring programmes showing the status of all water bodies and protected areas.

The WFD requires a register of protected areas, including the details on related water bodies. The register covers areas identified by the WFD or other related EU Directives. These include five general types of protected areas:

- Water bodies used for the abstraction of drinking water;
- Areas important for the protection of habitats and/or species where the maintenance or improvement of the status of water is an important factor in their protection (NATURA 2000<sup>1</sup>, sites under Birds Directive 79/409/EEC and Habitats Directive 92/43/EEC);
- Areas designated to protect economically significant aquatic species (areas protected under Freshwater Fish Directive 2006/44/EC; Shellfish Directive 79/923/EEC);
- Bathing waters (areas protected under Bathing Water Directives 76/160/EEC and 2006/7/EC); and
- Nutrient sensitive areas (areas protected under Nitrates Directive 91/676/EEC; Urban Wastewater Treatment Directive 91/271/EEC).

Waters used for abstraction of drinking water are specially identified in the WFD as one of the major target of protection. When such waters are identified, Environmental Quality Standards (EQS) for each pollutant must be established.

According to Article 6 of the WFD, other areas which are distinguished as needing special protection must also be identified. Areas designated for the protection of habitats or species where the measures aimed to preserve or to improve the status of water bodies are an important factor for their protection (Natura 2000 sites under Birds Directive 79/409/EEC and Habitats Directive 92/43/EEC). In addition, protected areas according to the WFD cover bathing waters (areas protected under Bathing Water Directives 76/160/EEC and New Bathing Water Directive 2006/7/EC), areas important from the aspect of protection of economically significant aquatic species (areas protected under Freshwater Fish Directive 2006/44/EC<sup>2</sup>), and nutrient sensitive areas (areas protected under Nitrates Directive 91/676/EEC; Urban Wastewater Treatment Directive 91/271/EEC).

Drinking Water Protected Areas are:

- Bodies of water used for the abstraction of water for human consumption which provide more than an average of 10 m<sup>3</sup> a day in total or which serve more than 50 persons;
- Bodies of water intended for such level of use in the future.

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<sup>1</sup> NATURA 2000 – the network of protected areas based on the Birds Directive (1979) and the Habitats Directive (1992).

<sup>2</sup> Shellfish Directive 79/923/EEC is not applicable in the case of the Sava RB

Under the Drinking Water Directive (98/83/EC), water for human consumption means all water either in its original state or after treatment which is:

- Intended for drinking, cooking and food preparation or other domestic purposes; or
- Used in any food production business for the manufacture, processing, preservation or marketing of products or substances intended for human consumption unless the competent national authorities in relation to drinking water quality are satisfied that the quality of water has no influence, directly or indirectly, on the health of consumers concerned.

### **3 Environmental objectives for protected areas**

Article 4 WFD sets out the general environmental objectives (mainly in Article 4.1). The main environmental objectives in the WFD include the following:

- No deterioration of status for surface and groundwater and the protection, enhancement and restoration of all water bodies;
- Achievement of good status by 2015 (good ecological status or potential) and good chemical status for surface waters and good chemical and good quantitative status for groundwater;
- Progressive reduction of pollution of priority substances and phase-out of priority hazardous substances in surface waters and prevention and limitation of input of pollutants in groundwater;
- Reversal of any significant, upward trend of pollutants in groundwater;
- Achievement of standards and objectives set for protected areas in Community legislation.

In the case of protected areas, it is important to note that where more than one of the objectives relates to a given body of water, all objectives must be achieved and the most strict shall be applied (Art. 4.2). This means that some areas may require special protection under more than one EC Directive or may have additional (surface water and/or groundwater) objectives. In these cases, all the objectives and standards must be met.

Article 4 of the WFD requires Member States to achieve compliance with the standards and objectives set for each protected area by 22 December 2015, unless otherwise specified in the Community legislation under which the protected area was established. For exemptions regarding the objectives see Guidance document No. 20.

Protected areas have their own objectives and standards.

The specific objectives for Drinking Water Protected Areas are to:

- Sets quality standards for drinking water quality at the tap (microbiological, chemical and organoleptic parameters) and the general obligation that drinking water must be healthy and clean;
- Ensure that, under the water treatment regime applied, the drinking water produced meets the requirements of the Drinking Water Directive;
- Ensure necessary protection in the area with the aim of prevention of deterioration in water quality in order to reduce the level of purification treatment required in producing drinking water;
- Obliges Member States to regular monitoring of drinking water quality and to provide to consumers adequate and up-to-date information on their drinking water quality.

The general objective of the Drinking Water Directive (98/83/EC) is to protect the health of the consumers in the European Union and to make sure the water is wholesome and clean. In order to adapt the Directive to progress in science and technology, to adapt it to the most recent health standards and to ensure consistency with EU water policy and legislation, in particular the WFD, the Commission is currently preparing a revision of the Directive.

The objective for freshwater fish waters designated under the Freshwater Fish Directive (2006/44/EC) is to protect or improve the quality of running or standing freshwaters to enable them to support fish belonging to native species contributing to the natural diversity or species designated by competent authority as an important from the aspect of the water management. The Freshwater Fish Directive will be repealed in 2013 and waters currently designated as Fish Directive waters will become protected areas under the WFD.

The objective for shellfish waters designated under the Shellfish Water Directive is not relevant for the Sava RB because it covers only brackish and salt water taxa.

The objective for bathing waters designated under the current Bathing Waters Directive is to protect the environment and public health whilst bathing. The objective under the revised Bathing Waters Directive is to preserve, protect and improve the quality of the environment and to protect human health by complementing the WFD.

This objective will be achieved by meeting the quality standards of the revised Bathing Waters Directive; and by taking effective measures with aim to increase the quality of bathing waters (or the number of those waters classified as “excellent” or “good”).

The general objective of the Nitrates Directive (91/676/EEC) is to reduce water pollution caused by nitrates from agricultural sources. This objective will be achieved through designation of Nitrate Vulnerable Zones and implementing relevant actions.



The general objective of the Urban Waste Water Treatment Directive (91/271/EEC) is to protect the environment from the adverse effects of urban waste water discharges and waste water discharges from certain industrial sectors. This apply to water bodies identified as affected by eutrophication or having a surface water abstraction affected by elevated nitrate concentrations. Designating Sensitive Areas is a trigger for action to reduce or prevent further pollution caused by nutrients. The general objective for Sensitive Areas will be achieved by ensuring discharges from relevant urban waste water treatment plants meet the appropriate emission standards set out in the Directive.

The objective for NATURA 2000 Protected Areas identified in relation to relevant areas designated under the Habitats Directive (92/43/EEC) is to protect and, where necessary, improve the status of the water body (ies) to the degree necessary to achieve the conservation objectives that have been established for the protection or improvement of the particular natural habitat type or species of Community importance. The site thus should contribute to the maintenance or improvement of the favourable conservation status. Specific objective for NATURA 2000 Protected Areas identified in relation to relevant areas designated under the Birds Directive (79/409/EEC) is to protect and where necessary improve the water status to the level necessary to achieve the conservation objectives that are defined for the protection and/or improvement of the site in order to ensure that it contributes to the survival and reproduction of birds taxa listed in Annex I of the Birds Directive. Where a NATURA 2000 Protected Area forms part of a water body or where a water body lies within a NATURA 2000 Protected Area, the WFD general status related objectives (or potential in the case of heavily modified and artificial water bodies) apply in addition to the conservation objectives. In the case of NATURA 2000 sites, the objectives should be fulfilled in 2015 according to WFD, because EC Habitats and Birds Directives do not specify specific deadlines.

## **4 Monitoring of protected areas**

Additional monitoring is needed for the protected areas. Monitoring programs should include specific sub-programs for the areas included in the Register of Protected Areas. Beside requirements for surface and groundwater status Article 8 of the WFD sets out the requirements for the monitoring of protected areas. This specific monitoring should ensure the assessments with the standards and objectives defined for particular protected area type.

## **5 Protected areas within the Sava River Basin**

Protected areas have their own objectives and standards and inventory is required by the WFD.

As it was previously emphasized, the national legislation related to protected areas in non-EU countries within the Sava RB is not fully harmonized with the EU standards.

Thus, the modified approach in dealing with protected areas should be used, having in mind the different national standards for the delineation of protected areas.

The Sava River Basin covers a large area with diverse natural characteristics of the terrain. It is a complex river system.

## **5.1 Register of protected areas for the Sava RB and suggestion of the criteria**

As it was previously emphasized, Sava RBMP should comprise the inventory of water relevant protected areas according to Article 6 of the WFD.

In the case of the Sava RBMP, the modified approach in dealing with protected areas should be applied, having in mind:

- National standards for the delineation of PA;
  - A different status within Bern Convention implementation and NATURA 2000 network design within the countries;
  - The different level of adaptation of national legislation to EU legislation and standards in non-EU countries;
  - The general lack of registers and/or effective databases of PA in certain countries;
  - Shared responsibility regarding maintenance and the protection of drinking water zones between national and sub-national level competent authorities;
- Shared responsibility for the monitoring of drinking water protection areas. Based on the data availability analyses and relevance of each type of protected area for the Sava RB, the Sava RBMP should include:
- The register of areas important for the protection of habitats and/or species that are protected under some of the relevant international conventions;
  - The register of areas important for the protection of habitats and/or species protected according to the national legislative; and
  - The preliminary register of areas used for the abstraction of drinking water - groundwater. In this moment, having in mind data availability (e.g. the in Serbia and Bosnia and Herzegovina the identification of surface water protection zones is responsibility of Public Enterprise responsible for water supply and/or municipal authorities and the data are not systematized and collected in central registries) and state of the art of process of identification of the drinking water protection zones for surface water abstraction, the register of surface water

abstraction protection zones could not be provided. Further efforts for the next RBM cycles will still be necessary.

## 5.2 Register of areas protected from the aspect of nature conservation

For the inventory of the protected areas that are relevant from the aspect of nature conservation, the following criteria are selected to be used for the Sava RBMP:

- Areas protected on national, sub-national level (municipal, provincial, cantonal, etc.) and areas that are covered by specific international initiatives (NATURA 2000<sup>3</sup>, RAMSAR sites);
- The protected area should be of significance with regard to water ecosystem protection, and/or protection of water dependent habitats and/or protection of aquatic, semi-aquatic biota, as well as the taxa that depends on aquatic ecosystem health;
- Areas larger than 100 ha;
- Additional habitats/areas recommended by countries, based on specific expertise – e.g. habitats <100 ha that are specifically important for preservation of an endangered taxa or habitat type, or that are habitat of endemic taxa that are suspicious that are endangered or that may be endangered in near future.

Having in mind the size of the Sava RB, the purpose of the RBM Plan, the difference in national standards for the delineation of protected areas and state of the art in Bern Convention implementation and NATURA 2000 network design within the countries, the Sava RBMP covers all protected areas larger than 100 ha.

Suggested threshold value is arbitrarily proposed limit, based on evaluation of total number of protected areas, relevance of the habitat from the aspect of “basin wide importance”, and total number of the sites that satisfy the criteria.

The lack of general register/database of protected areas from the aspect of nature conservation in some countries that covers all necessary information was additional reason for proposal of abovementioned set of criteria.

Additional criteria (habitats <100ha that are specifically important for preservation of an endangered taxa or habitat type, or that are habitat of endemic taxa that are suspicious that are endangered or that may be endangered in near future) are also suggested to be included in the register, due to the possible importance of some habitats for conservational aspect, as well as the connection of particular habitats with water relevant issues.

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<sup>3</sup> NATURA 2000 – the network of protected areas based on the Birds Directive (1979) and the Habitats Directive (1992).

One of the important sources for the development of the register of protected areas from the aspect of nature conservation within SRB was the list of protected areas produced within the Life project (“Protection of Biodiversity of the Sava River Basin Floodplains” – LIFE06 TCY/INT/246) has been used. One of the main challenges of the mentioned project was to develop a harmonized database structure and procedures in accordance with the EU reporting requirements for NATURA 2000.

Within the Life project, based on the data about distribution of species and habitats, in total 49 sites important for biodiversity were identified along the Sava River - 16 sites with total area of 13,422.74 ha in Bosnia and Herzegovina, 16 sites with total area of 180,689.90 ha in Croatia, 9 sites with total area of 50,457.00 ha in Serbia, and 8 sites with total area of 124,352.10 ha in Slovenia. The LIFE project data covers only the sites along the main course of the Sava River. From the list provided 47 sites that are larger than 100 ha have been included in the list of areas protected from the aspect of nature conservation relevant for SRBMP.

For the preparation of preliminary list, the data on NATURA 2000 sites, Important Bird Areas, RAMSAR sites and sites that are protected according to national or sub-national legislative has been collected.

Taking into the consideration collected data and criteria selected, a first preliminary list of protected areas was provided in August 2010. This register covered 127 water relevant sites.

Based on additional information, the register has been constantly updated. According to the updated register of areas important for biodiversity 176 water relevant sites were identified with total surface area of more than 17,231.24 km<sup>2</sup> (77 sites with total area of 719,845.28 ha in SI, 41 site with total area of 719,845.28 ha in HR, 29 sites with total area of 102,626.95<sup>4</sup> ha in BA, 21 site with total area of 103,448.03 ha in RS and eight sites with total area of 281,146.41 ha in ME).

The register includes nine national parks within the Sava RB (Triglav, Plitvice, Risnjak, Sutjeska, Kozara, Una, Tara, Durmitor and Biogradska gora) with total coverage of 221,958.515 ha, as well as three parks of nature with total area of 90,921.006 ha. Besides, seven Ramsar sites<sup>7</sup> are situated within the Sava RB (Bardača in BA, Lonjsko polje and Crna Mlaka in HR, Peštersko polje, Obedska bara and Zasavica in RS and Cerknjiško Lake in SI), with total area of 71,673.00 ha..

The list of PAs includes 121 Natura 2000 sites (total area coverage of 1,281,663.71 ha), out of which 12 sites are important for the protection of avifauna (proposed to preserve the birds species enumerated in the Birds Directive - 79/409/EEC), 91 sites are

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<sup>4</sup> The data still not complete – the information on area for Semešnica Park of Nature still missing.

<sup>5</sup> Only a part of NP Triglav in Slovenia is within the Sava RB.

<sup>6</sup> Only a part of Park of Nature Papuk is within the Sava RB.

<sup>7</sup> “Ramsar sites”, sites selected as Wetlands of International Importance according to The Convention on Wetlands of International Importance from 1971 (“Ramsar Convention”).

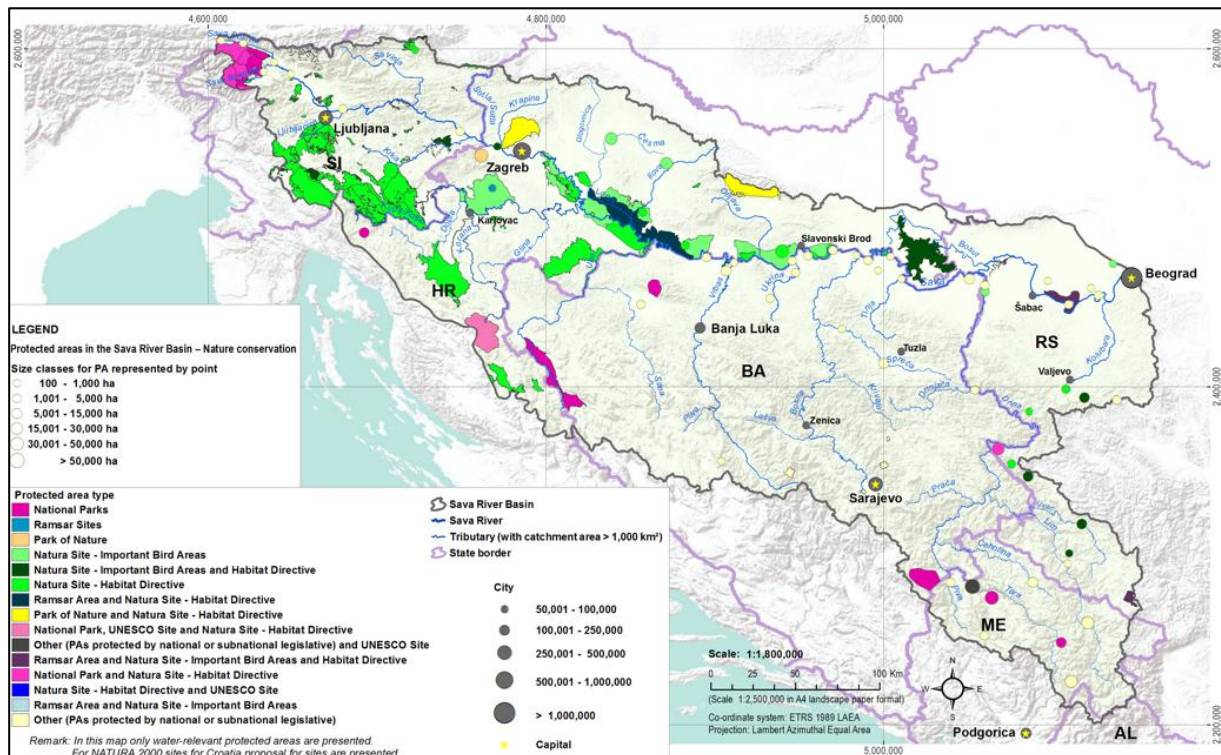
proclaimed as of the Community importance for protection of the habitat types and the species enumerated in Habitats Directive 92/43/EEC and 18 sites are important in accordance with both directives.

The register comprises the following data:

- Code(s);
- Name;
- Type of protection;
- Surface area;
- Coordinates; and
- Field expressing the PA water relevance.

The lack of general register/database of protected areas from the aspect of nature conservation that covers all necessary information was additional reason for proposal of above-mentioned set of criteria.

Figure 1: Protected areas relevant for the nature conservation within Sava RB with indication of type and size classes



Different types of protection approaches are consequence of the fact that national legislation in non-EU countries is still not harmonized with the EU legislative.

As it was emphasized, Slovenia delineated all areas identified according to the WFD or other related directives and the sites are more precisely defined than in the case of other countries. Consequently, PA register in Slovenia covers more sites of smaller size (the

complete register of sites according to NATURA 2000 in Slovenia covers 286 sites). Thus, according to applied criteria for the Sava RBM register (area >100 ha and water relevance) significant number of PA from Slovenia is not covered by the register. In the case of other countries, having in mind generally larger size of PAs, smaller number of PAs do not match criteria selected to be included in the Sava RBM register of PAs. The divergence in number/size relation between countries is obvious according to above presented data on the number of PAs and total area per country.

In case of other countries the register covers areas protected according to national legislation (different level of protection - National Parks, Parks of Nature and Natural reserves), areas protected according to international legislation (RAMSAR sites, UNESCO sites), that are in the same time protected according to national legislative, as well as sites that are identified as important from the aspect of habitat or species protection, but that are not under the protection according to national legislative (Important Plant Areas, Important Bird Areas). The sites not covered by national legislation are marked at in Annex 1.

### **5.3 Register of areas protected from the aspect of protection of drinking water abstraction zones**

In general, the areas protected from the aspect of drinking water abstraction zones cover those that are connected with groundwater abstraction and surface water abstraction.

#### ***Protection of groundwater abstraction areas***

Groundwater is a main source of drinking water in the Sava RB and important water supply source for industry and agriculture (80-95% of quantities used for this purpose). According to Annex 4 of the WFD, Drinking Water Protected Areas (DWPAs) are areas designated for the abstraction of water intended for human consumption (under Article 7 of the WFD). DWPAs include safeguard zones (significantly smaller than this body), where measures can be focused to protect groundwater that is abstracted for human consumption from deterioration in groundwater quality and thereby meet the requirements of Article 7.3 and Article 4.1(c).

Based on the term of “groundwater DWPAs” used in CIS Guidance Document no. 16<sup>8</sup>, 86 GWBs intended for human consumption, providing more than 10 m<sup>3</sup> a day as an average or serving more than 50 persons, as well as those bodies of water intended for such future use could be identified within the Sava RB (Annex 2).

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<sup>8</sup> CIS Guidance Document no.16: *Guidance on Groundwater in Drinking Water Protected Areas*, 2006

### ***Protection of surface water abstraction areas***

In the case of collection of the data on areas of protection of surface water abstraction, the situation within the SRB is complex issue.

The following difficulties in regard to preparation of register of surface water abstraction protected areas were identified:

- In some countries (Serbia, Bosnia and Herzegovina and Montenegro), the central register with relevant data on surface area of protection zones and capacity of surface water abstraction is not available;
- The municipal authorities are responsible for identifying of protection zones and protection measures in some countries, thus the data collection is time consuming;
- The definition of protection zones of surface water abstraction is still ongoing issue (e.g. in the Bosnia and Herzegovina);

Thus, in this moment it is not possible to collect the data necessary to define criteria to be used in the SRBM for the surface water abstraction zones of “basin wide importance”.

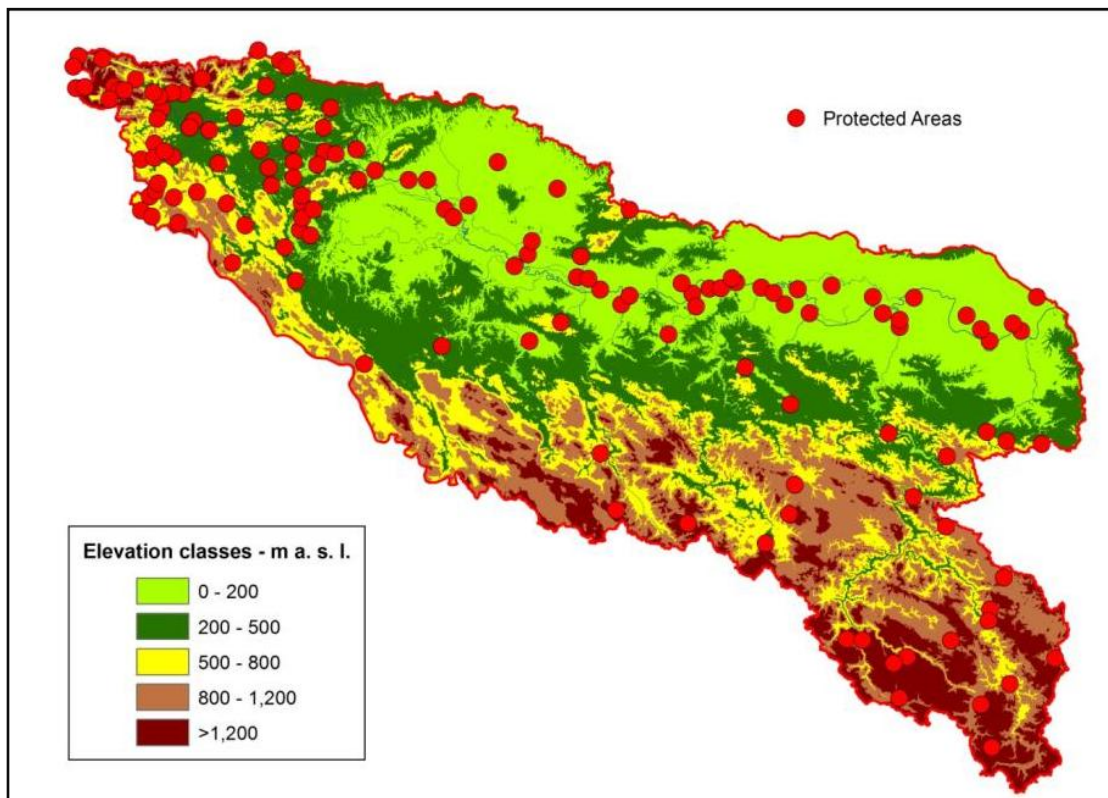
The general criteria should define certain capacity and/or surface area of protection zones, as well as areas that are found to be under specific anthropogenic pressure caused by:

- Intensive agriculture; and
- Point sources of pollution.

## **6 The main pressures on protected areas**

In general, different pressures could influence PA on diverse territory such as the Sava RB. In lowland parts, agricultural activities and urban waste waters (nutrient and organic pollution) could contribute to the degradation of PA. As it is shown on the Figure 2, a majority of protected areas is located within lowland areas.

The lowland areas along the Sava River, as well as lower stretches of the major tributaries are densely populated and artificial surfaces and agricultural land dominate (Figure 3).

**Figure 2:** Position of protected areas in regards to altitude

In general, the pressures that could influence water relevant PAs are:

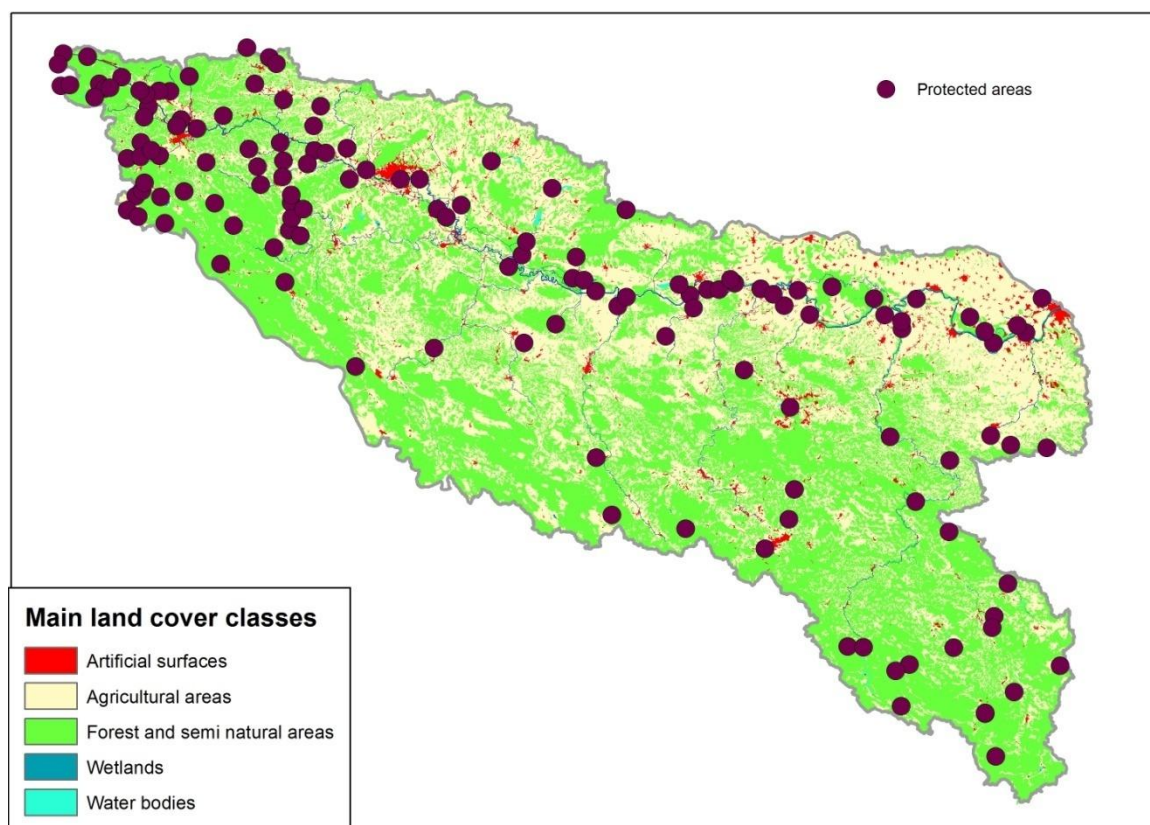
- hydromorphological alteration;
- organic and nutrient pollution and
- the introduction of alien invasive species.

The influence of hydromorphological alteration on protected areas could be clearly illustrated by the map showing the position of the main hydrological structures within SRB and location of protected areas (Figure 3).

Further, the influence of hydromorphological pressures on protected areas could be seen from the relation of their position in regard to water bodies that are characterized as heavily modified, or candidates (Figure 4).

Certain pressure on protected areas could be expected as the consequence of pollution by priority and hazardous substances. This influence is especially possible on the protected areas that are situated along the main course of the Sava River and its main tributaries.



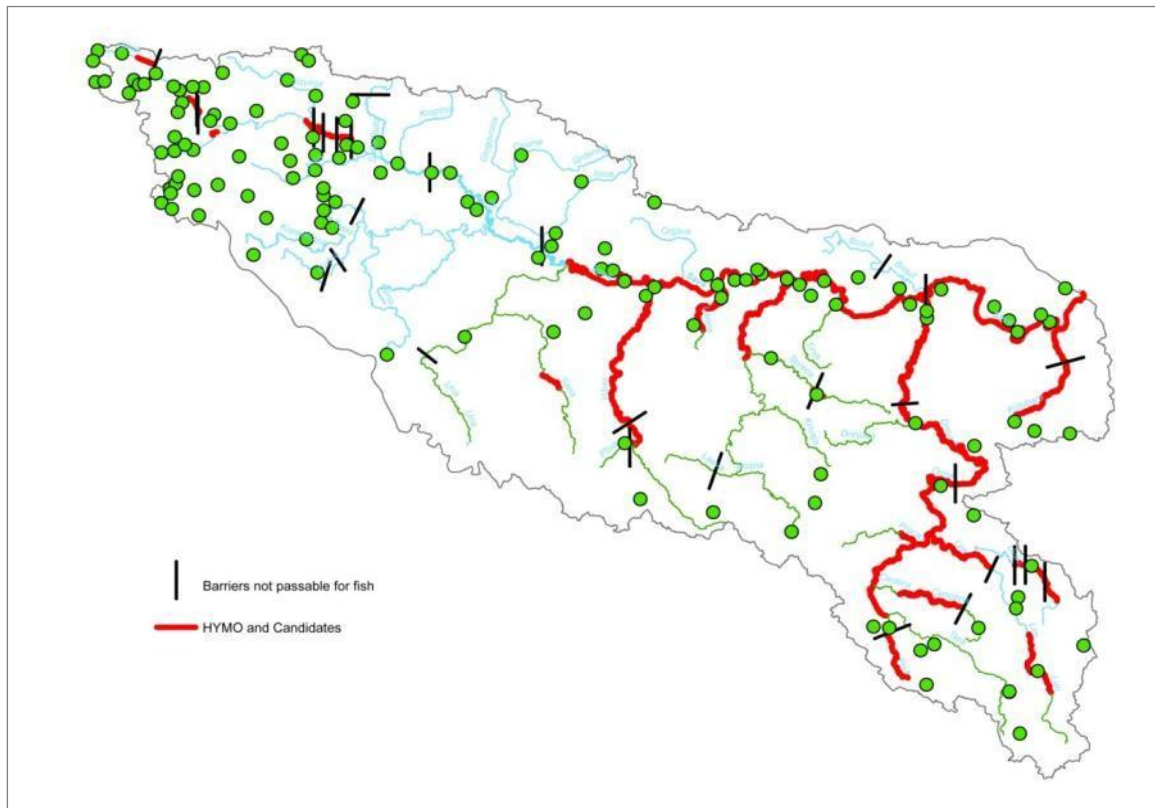
**Figure 3:** Position of protected areas in regards to urban and agricultural areas

Dropping of ground water level, mostly due to the exploitation of river bad material (sand and gravel extraction), as well as change of the water regime (e.g. preventing of periodical flooding as consequence of embankment and damming) the structure and functioning of floodplain wetlands depend on can threaten water dependent PAs, especially lowland forests.

Although flood protection systems could negatively influence PA, there are examples within Sava RB that those systems contributes to the conservation, even the development of areas valuable for biodiversity conservation, such as the Lonjsko Polje Park of Nature in Croatia.

Quite often, pressures can be lowered or fully mitigated through wise planning and the application of the best available technologies. Identifying these opportunities is one of the tasks of the Sava River Basin Management Plan.

**Figure 4:** Position of protected areas in regard to hydromorphological barriers and in regard heavily modified water bodies and candidates



## 7 Water dependent ecosystem services

To provide full ecosystem services understanding within the Sava RB, the basic knowledge on PA should be systematized, including the identification of key aspects of biodiversity (taxa and habitats), natural landscapes and environmental factors. The provided list of PA is the first step towards such systematization.

Ecosystem services associated with PA within the Sava RB could mainly be characterized as provisional (linked to drinking water production) and cultural, but other aspects should not be neglected (related to the landscape and biodiversity conservation and associated sub-groups).

PAs contribute not only to the halting of the loss of biodiversity, but also to conservation, and the improvement of relevant ecosystem services. However, the Sava basin is rich in valuable water-dependent ecosystems both within and beyond the borders of the PA. The vast lowland and alluvial forests, which are characteristic for the region, are an important resource with multiple functions and economic significance: they provide valuable timber, store a significant amount of climate-relevant carbon and prevent soil erosion. However, if the groundwater level drops, these forests and their service

function deteriorate. Similarly, floodplain wetlands provide a host of benefits to people as long as they enjoy a proper water regime. The retention volume of the Sava wetlands is outstanding and this lowers flood peaks when water levels are high. This function would be very costly to replace with “grey” infrastructure. These wetlands are also a source of water during droughts, which is of growing importance as a result of climate change. The Sava wetlands also purify water and while effective treatment plants are in short supply, this benefit should not be underestimated.

The economic value of ecosystem services can be included in cost-benefit analyses and in payment for ecosystem service schemes (see Chapter 8.5.3.), thereby creating incentives for their protection.

## 8 References

COM/2010/0047 final. Report from the Commission to the Council and the European Parliament on implementation of Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources based on Member State reports for the period 2004-2007 SEC(2010)118.

COMMISSION DECISION of 13 November 2007 adopting, pursuant to Council Directive 92/43/EEC, a first updated list of sites of Community importance for the Continental biogeographical region (2008/25/EC)

Council Directive **92/43/EEC** of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. Official Journal L 206 , 22/07/1992

Directive 2006/44/EC European Parliament and of the Council of 6 September 2006 on the quality of fresh waters needing protection or improvement in order to support fish life.

Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 on the concerning the management of bathing water quality and repealing Directive 76/160/EEC.

Directive 2009/147/EC of the European Parliament and the Council of 30 November 2009 on the conservation of wild birds.

Directive 76/160/EEC concerning the quality of bathing waters.

Directive 91/271/EEC concerning urban waste-water treatment was adopted on 21 May 1991.

Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.

Govedič M., M. Bedjanič, V. Grobelnik, A. Kapla, J. Kus Veenvliet, A. Šalamun, P. Veenvliet & A. Vrezec, (2007). Dodatne raziskave kvalifikacijskih vrst Natura 2000 s predlogom spremljanja stanja – raki (kočno poročilo). Naročnik: Ministrstvo za okolje in prostor, Ljubljana. Center za kartografijo favne in flore, Miklavž na Dravskem polju. 127 str.

Guidance Document No 1, Common Implementation Strategy for the Water Framework Directive (2000/60/EC) Economics and the Environment The Implementation Challenge of the Water Framework Directive *WATECO* (2003).

Guidance Document No 20, Common Implementation Strategy for the Water Framework Directive (2000/60/EC) (2009). Guidance document on exemptions to the environmental objectives.

The Drinking Water Directive (98/83/EC).

Uredba o proglašenju ekološke mreže (NN 109/07)

Uredba o ekološkoj mreži (Official Gazette of the RS, 102/2010)

### Annex 1: Register of protected areas relevant from the aspect of nature conservation within the Sava River Basin.

COUNTRY	CODE	PROTECTED AREA NAME	AREA (ha)	TYPE
SI	SI3000005	Mateča voda in Bistrica	193.24	H
SI	SI3000007	Potočnikov potok	406.59	H
SI	SI3000008	Dolgi potok na Rudnici	174.01	H
SI	SI3000015	Medvedje Brdo	189.00	H
SI	SI3000016	Zaplana	216.28	H
SI	SI3000237	Poljanska sora log-Škofja Loka	157.72	H
SI	SI3000017	Ligojna	139.73	H
SI	SI3000021	Podreber - Dvor	191.90	H
SI	SI3000026	Ribniška dolina	431.44	H
SI	SI3000046	Bela Krajina	538.00	H
SI	SI3000048	Dobličica	382.26	H
SI	SI3000049	Temenica	156.03	H
SI	SI3000051, SI5000012	Krakovski gozd, Krakovski gozd – Šentjernejsko	9,533.00	H,B
SI	SI3000055	Stobe - Breg	101.80	H
SI	SI3000056	Vejar	226.01	H
SI	SI3000057	Vrhtrebnje - Sv. Ana	691.00	H
SI	SI3000059	Mirna	517.00	H
SI	SI3000062	Gradac	1,491.03	H
SI	SI3000067	Savinja -Letuš	225.01	H
SI	SI3000075	Lahinja	824.00	H
SI	SI3000079	Prevoje	313.40	H
SI	SI3000094	Bidovčeva jama	155.66	H
SI	SI3000099	Ihan	184.00	H
SI	SI3000100	Gozd Kranj - Škofja Loka	1,951.00	H
SI	SI3000101	Gozd Olševk - Adergas	833.00	H
SI	SI3000111	Savinja pri Šentjanžu	141.64	H
SI	SI3000118	Boč - Haloze - Donačka gora	10818.12	H
SI	SI3000120	Šmarna gora	1680.96	H
SI	SI3000126, SI5000017	Nanoščica, Nanoščica porečje	1,941.00	H,B
SI	SI3000129	Rinža	235.11	H, B
SI	SI3000155	Sora Škofja Loka - jezero Goričane	170.56	H
SI	SI3000166	Razbor	1,467.00	H
SI	SI3000170	Krška jama	436.39	H
SI	SI3000171	Radensko polje - Viršnica	500.00	H
SI	SI3000173	Bloščica	785.00	H
SI	SI3000175	Kolpa	850.00	H
SI	SI3000181	Kum	5,852.00	H
SI	SI3000188	Ajdovska planota	2,411.00	H
SI	SI3000191	Ajdovska jama	1,706.00	H
SI	SI3000192	Radulja	1,229.00	H
SI	SI3000201	Nakelska Sava	116.62	H
SI	SI3000203	Kompoljska jama - Potiskavec	157.18	H
SI	SI3000204	Globočec	105.90	H
SI	SI3000205	Kandrše	1,329.00	H
SI	SI3000206	Marijino brezno	1,248.00	H
SI	SI3000219	Grad Brdo - Preddvor	580.00	H
SI	SI3000224	Huda luknja	3014.79	H
SI	SI3000227	Krka	1,339.13	H
SI	SI3000231	Javorniki - Snežnik	43,821.00	H

COUNTRY	CODE	PROTECTED AREA NAME	AREA (ha)	TYPE
SI	SI3000232	Notranjski trikotnik	15,202.00	H
SI	SI3000253, SI5000019	Julijske Alpe , Triglav*	84,550.00	H, B,NP,U
SI	SI3000255	Trnovski gozd - Nanos	52636.48	H
SI	SI3000256	Krimsko hribovje - Menišija	20107.19	H
SI	SI3000259	Bohinjska Bistrica	650.14	H
SI	SI3000260	Blegoš	1571.94	H
SI	SI3000262	Sava - Medvode - Kresnice	382.99	H
SI	SI3000263, SI5000013	Kočevsko, Kočevsko - Kolpa	106,342.00	H, B
SI	SI3000266	Kamenški potok	127.40	H
SI	SI3000267	Gorjanci - Radoha	11,607.00	H
SI	SI3000268	Dobrava - Jovsi	2,902.00	H
SI	SI3000270, SI5000006	Pohorje Pohorje	388.92	H,B
SI	SI3000271, SI5000014	Ljubljansko barje	12,666.00	H,B
SI	SI3000273	Orlica Orlica	3772.78	H
SI	SI3000274	Bohor	6,793.00	H
SI	SI3000275	Rašica	2212.32	H
SI	SI3000278	Pokljuška barja	872.00	H
SI	SI3000285	Karavanke	23066.29	H
SI	SI5000002	Snežnik - Pivka	54,906.00	B
SI	SI5000015	Cerkniško jezero	3,357.00	H,B, R
SI	SL025300	Sava Bohinjka in Sava Dolinka	936.54	O
SI	SL025400	Sava od Radovljice do Kranja s sotocjem Tržiške Bistrice	877.91	O
SI	SL026400	Sava Bohinjka z Mostnico in Ribnico	455.74	O
SI	SL026800	Sava Dolinka od Zelencev do Hrušice	337.40	O
SI	SL027700	Zelenci in Ledine pod Ratečami	112.20	O
SI	SL033500	Sava od Mavčič do Save	3,229.39	O
SI	SL063700	Sava od Radec do državne meje	2,837.65	O
HR	HR	Park prirode Žumberak	33,300.00	PN
HR	HR	Nacionalni park "Risnjak"	6,400.00	NP
HR	HR1000001	Pokupski bazen	44,951.00	B
HR	HR1000002	Sava kod Hruščice (s okolnim šljunčarama)	1,758.00	B
HR	HR1000003	Turopolje	22,735.00	B
HR	HR1000004	Donja Posavina	125,615.00	B
HR	HR1000005	Jelas polje s ribnjacima i poplavnim pašnjacima uz Savu	41,755.00	B
HR	HR1000006	Spačvanski bazen	42,902.00	H, B
HR	HR1000009	Ribnjaci uz Česmu - Siščani, Blatnica, Narta i Vukšinc	23,224.00	B
HR	HR1000010	Poilovlje s ribnjacima Končanica, Garešnica i Poljana	27,352.00	B
HR	HR1000040	Papuk	36,258.00	B
HR	HR2000414	Izvorišno područje Odre	905.00	H
HR	HR2000415	Odransko polje	8,493.00	H
HR	HR2000416	Lonjsko polje	50,157.00	H, R
HR	HR2000420	Sunjsko polje	20,352.00	H
HR	HR2000421	Ribnjaci Lipovljani	1,940.47	H
HR	HR2000422	Ribnjaci Sloboština - Vrbovljani	1,352.95	H
HR	HR2000424	Vlakanac - Radinje	3,194.00	H
HR	HR2000425	Jelas polje	10,430.94	H
HR	HR2000426	Dvorina	2,055.00	H
HR	HR2000427	Gajna	565.00	H

COUNTRY	CODE	PROTECTED AREA NAME	AREA (ha)	TYPE
HR	HR2000431	Sava - Štitar	1718.00	H
HR	HR2000439	Dolina rijeke Bjele	516.00	H
HR	HR2000452	Zrinska gora	35,645.00	H
HR	HR2000463	Dolina rijeke Une	3,698.00	H
HR	HR2000465	Žutica	4,695.00	H
HR	HR2000580	Park prirode "Papuk"	35,020.00	H, PN
HR	HR2000583	Park prirode "Medvednica"	22,601.00	H, PN
HR	HR2000592	Ogulinsko-plašćansko područje	43,461.00	H
HR	HR2000593	Mrežnica - Tounjčica	1,520.00	H
HR	HR2000595	Rijeka Korana	2,515.00	H
HR	HR2000609	Dolina rijeke Dretulje	581.00	H
HR	HR2000620	Mala i Velika Utinja	2,149.00	H
HR	HR2000631	Rijeka Odra	502.00	H
HR	HR2000642	Rijeka Kupa	6,282.00	H
HR	HR2000879	Lapačko polje	2,222.00	H
HR	HR2001116	Sava	11,953.00	H
HR	HR2001121	Sava - Podsused	377.92	H, B
HR	HR2000449	Crna Mlaka	625.00	R
HR	HR5000020	Nacionalni park Plitvička jezera s Vrhovinskim poljem	26,639.00	H, NP, U
HR	HR2000632	Krbavsko polje	11,430.00	H
BA	BA	Vrelo rijeke Bosne	603.00	O
BA	BA	Skakavac (područje slapa)	1,430.70	O
BA	BA	Bijambare	367.36	O
BA	BA	Nacionalni park "Kozara"	3,494.51	NP
BA	BA	Nacionalni park "Una"	19,800.00	NP
BA	BA	Tajan	35,10.00	O
BA	BA	Prokoško jezero*	2,119.00	O
BA	BA	Semešnica	360.00	O
BA	BA00001	Ribnjak Saničani*	4,316.35	O
BA	BA00002	Plivska jezera	395.88	O
BA	BA00003	Bosanska gradiška*	3,238.57	O
BA	BA00004	Ribnjak Bardača*	8,961.79	O
BA	BA00005	Zaštićeno područje "Bardača"	3,500.00	O, R
BA	BA00006	Srbac*	270.31	O
BA	BA00007	Ribnjak Prnjavor*	1,221.86	O
BA	BA00008	Ukrina*	1,181.96	O
BA	BA00009	Liješće polje*	3,743.98	O
BA	BA00010	Dolina rijeke Spreče*	266.00	O
BA	BA00011	Donji Svilaj*	1,750.69	O
BA	BA00012	Vojskova*	321.78	O
BA	BA00013	Jezero Modrac*	10,989.76	O
BA	BA00014	Velika i Mala Tišina	1,521.16	O
BA	BA00015	Žabar*	616.17	O
BA	BA00016	Orašje*	110.42	O
BA	BA00017	Lončari*	699.35	O
BA		Rača*	10,989.76	O
BA		Gromiželj	831	O

COUNTRY	CODE	PROTECTED AREA NAME	AREA (ha)	TYPE
BA	BA00018	Patkovaca i rijeka Usora – Derventa*	2,275.59	O
BA	BASutjeska	Nacionalni park "Sutjeska"	17,250.00	NP
RS	RS	Rajac	1,200.00	O
RS	RS	Vodopadi Sopotnice	209.00	O
RS	RS0000018	Šargan-Mokra gora	10,813.00	H, B
RS	RS0000037	Pešter (Peštarsko polje)	3,543.00	H, B, R
RS	RS0000054	Rijeka Gradac	1,268.00	H
RS	RS023IBA	Donja Drina	4,706.00	B
RS	SR0000009	Nacionalni park „Tara“	19,175.00	H, B, NP
RS	SR0000025	Nacionalni rezervat Uvac	7,543.00	H, B
RS	SR0000026	Mileševka reka	296.64	H, B
RS	SR0000036 RS025IBA	Valjevske planine	11,000.00	H, B
RS	SR0000039	Rijeka Trešnjica	595.00	H
RS	SRB_001	Ušće Save u Dunav-Veliko Ratno Ostrvo	212.06	B
RS	SRB_002	Crni Lug - Ribnjak Živaca	1,221.14	O
RS	SRB_003	Bojčinska šuma	709.50	O
RS	SRB_004	Ključ-Orlaca	1,284.89	O
RS	SRB_005	Ušće Drine	2,599.43	O
RS	SRB_006	Obedska Bara	9,820.00	H, B, R
RS	SRB_007	Zasavica	671.00	H, B, R
RS	SRB_008	Trskovača	381.60	O
RS	SRB_009; RS021IBA	Morovičko Bosutske šume	21,899.77	B
RS	RS0000057	Zaovine	4,300.00	H
ME	ME	Nacionalni park "Durmitor" sa kanjonom Tare	39,000.00	NP
ME	ME	Sliv rijeke Tare	182,889.00	O, U
ME	ME	Kanjon Komarnice	1,437.86	O
ME	ME	Kanjon rijeke Pive	1,664.07	O
ME	ME	Dolina Lima	17,148.52	O
ME	ME	Dolina rijeke Ćehotine	13,356.96	O
ME	ME	Komovi	21,000.00	O
ME	ME	Nacionalni park "Biogradska gora"	5,650.00	NP

\* Total area out of which 49,362.39 ha is in the Sava River Basin.

\* The sites are not currently protected by national legislation.

**Legend:** **NP** – National Park; **PN** – Park of Nature; **B** – NATURA 2000 sites important for the protection of avifauna (proposed to preserve the birds species enumerated in the Birds Directive - 79/409/EEC); **H** – NATURA 2000 sites proclaimed as of the Community importance for protection of the habitat types and the species enumerated in Habitats Directive 92/43/EEC; **R** – “Ramsar sites”, sites selected as Wetlands of International Importance according to The Convention on Wetlands of International Importance from 1971 (“Ramsar Convention”); **U** – UNESCO World Heritage Site, the site that is listed by the UNESCO (The United Nations Educational, Scientific and Cultural Organization) as of special cultural or physical significance (the list is maintained by the international World Heritage Programme administered by the UNESCO World Heritage Committee); **O** – other, site protected by national or sub-national legislative.



**Annex 2: Summary table of groundwater Drinking Water Protected Areas within the Sava River Basin.**

No.	Country Code	GWB (DWPA) Name	GWB National Code	Transboundary GWB (Yes/No)	GWB Size [km <sup>2</sup> ]
1.	SI	Savska kotlina in Ljubljansko Barje	1001	Ne	774.00
2.	SI	Savinjska kotlina	1002	Ne	109.00
3.	SI	Krška kotlina	1003	Da	97.00
4.	SI	Julijske Alpe v porečju Save	1004	Da	772.00
5.	SI	Karavanke	1005	Da	414.00
6.	SI	Kamniško-Savinjske Alpe	1006	Da	1,113.00
7.	SI	Cerkljansko, Škofjeloško in Polhograjsko	1007	Ne	850.00
8.	SI	Posavsko hribovje do osrednje Sotle	1008	Ne	1,792.00
9.	SI	Spodnji del Savinje do Sotle	1009	Da	1,397.00
10.	SI	Kraška Ljubljana	1010	Ne	1,307.00
11.	SI	Dolenjski kras	1011	Ne	3,355.00
12.	HR	Sliv Sotle i Krapine		Da	1,408.69
13.	HR	Zagreb		Da	5,197.09
14.	HR	Lekenik - Lužani		Da	1,572.46
15.	HR	Istočna Slavonija - Sliv Save		Da	988.31
16.	HR	Gornji tok Kupe		Da	3,447.78
17.	HR	Sliv Korane		Da	3,327.65
18.	HR	Gornji tok Une		Da	443.69
19.	HR	Sliv Lonja - Ilova - Pakra		Ne	2,873.63
20.	HR	Sliv Orljave		Ne	539.69
21.	HR	Žumberak - Somoborsko Gorje		Ne	1,016.22
22.	HR	Donji tok Kupe		Ne	754.67
23.	HR	Donji tok Une		Ne	1,370.14
24.	HR	Sliv Dobre		Ne	1,248.57
25.	HR	Sliv Mrežnice		Ne	1,513.71
26.	BA	Plješevica	BAGW_UNA_2	Da	1,350.00
27.	BA	Posavina II	BAGW_SAV_2	Ne	2,050.00
28.	BA	Romanija-Devetak-Sjemeč	BAGW_BO_DRN_1	Ne	1,240.00
29.	BA	Treskavica-Zelengora-Lelija-Maglić	BAGW_DRN_1	Ne	1,800.00
30.	BA	Manjača-Čemernica-Vlašić	BAGW_VRB_1	Ne	3,770.00
31.	BA	Grmeč-Srnetica-Lunjevača-Vitorog	BAGW_VRB_UNA_7	Ne	1,720.00
32.	BA	Unac	BAGW_UNAC_UNA_1	Ne	120.00
33.	RS	Loznicko Polje	DR_GW_I_1	Ne	243.88
34.	RS	Jadar	DR_GW_I_2	Ne	208.54
35.	RS	Gučevo	DR_GW_K_1	Ne	172.97
36.	RS	Povlen	DR_GW_K_2	Ne	322.37
37.	RS	Tara	DR_GW_K_3	Ne	299.58
38.	RS	Cer	DR_GW_P_1	Ne	110.80

No.	Country Code	GWB (DWPA) Name	GWB National Code	Transboundary GWB (Yes/No)	GWB Size [km <sup>2</sup> ]
39.	RS	Osečina	DR_GW_P_2	Ne	320.27
40.	RS	Krupanj	DR_GW_P_3	Ne	384.92
41.	RS	Boranja	DR_GW_P_4	Ne	68.23
42.	RS	Ljubovija	DR_GW_P_5	Ne	619.49
43.	RS	Zlatibor - zapad	DR_GW_P_6	Ne	522.30
44.	RS	Kolubara - neogen	KOL_GW_I_1	Ne	656.57
45.	RS	Kolubara - istok	KOL_GW_I_2	Ne	424.79
46.	RS	Tamnava	KOL_GW_I_3	Ne	276.82
47.	RS	Nepričava - karst	KOL_GW_K_1	Ne	609.19
48.	RS	Lelić - karst	KOL_GW_K_2	Ne	306.83
49.	RS	Ljig	KOL_GW_P_1	Ne	565.82
50.	RS	Peštan	KOL_GW_P_2	Ne	286.37
51.	RS	Kolubara - zapad	KOL_GW_P_3	Ne	502.30
52.	RS	Valjevo	KOL_GW_S_1	Ne	542.81
53.	RS	Zlatar	LIM_GW_K_1	Ne	112.38
54.	RS	Jadovnik	LIM_GW_K_2	Ne	107.33
55.	RS	Bučje	LIM_GW_K_3	Ne	147.38
56.	RS	Javorje	LIM_GW_P_1	Ne	217.75
57.	RS	Pobijenik	LIM_GW_P_2	Ne	559.27
58.	RS	Komaran	LIM_GW_P_3	Ne	426.28
59.	RS	Zapadni Srem - OVK	SA_GW_I_1	Ne	450.05
60.	RS	Istočni Srem - OVK	SA_GW_I_2	Ne	1,593.65
61.	RS	Mačva - OVK	SA_GW_I_3	Ne	763.41
62.	RS	Beograd - leva obala Save	SA_GW_I_4	Ne	283.06
63.	RS	Beograd - desna obala Save	SA_GW_I_5	Ne	179.68
64.	RS	Zapadni Srem - pliocen	SA_GW_I_6	Ne	1,172.92
65.	RS	Istočni Srem - pliocen	SA_GW_I_7	Ne	2,248.99
66.	RS	Mačva - pliocen	SA_GW_I_8	Ne	1,577.53
67.	RS	Beograd - krecnjak	SA_GW_K_1	Ne	60.64
68.	RS	Fruška gora	SA_GW_S_1	Ne	735.56
69.	RS	Beograd - jug	SA_GW_S_2	Ne	365.35
70.	RS	Sjenica	UV_GW_I_1	Ne	142.51
71.	RS	Zarudine	UV_GW_K_1	Ne	66.71
72.	RS	Vapa i Pešter	UV_GW_K_2	Ne	562.38
73.	RS	Radoinja	UV_GW_K_3	Ne	71.41
74.	RS	Javor - zapad	UV_GW_K_4	Ne	259.48
75.	RS	Nova Varoš	UV_GW_P_1	Ne	128.81
76.	RS	Stari Vlah - jug	UV_GW_P_2	Ne	172.22
77.	ME	Sliv rijeke Pive			1,500.00
78.	ME	Sliv rijeke Tare			2,000.00
79.	ME	Sliv rijeke Čehotine			800.00
80.	ME	Sliv rijeke Lim			2,000.00



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