

# Information Sheet on Ramsar Wetlands (RIS) – 2009-2012 version

Available for download from [http://www.ramsar.org/ris/key\\_ris\\_index.htm](http://www.ramsar.org/ris/key_ris_index.htm).

*Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8<sup>th</sup> Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX.22 of the 9<sup>th</sup> Conference of the Contracting Parties (2005).*

## Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 14, 3rd edition). A 4th edition of the Handbook is in preparation and will be available in 2009.
3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

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### 1. Name and address of the compiler of this form:

Jasminka Radović  
State Institute for Nature Protection  
Trg Mažuranića 5  
HR - 10000 Zagreb  
Republic of Croatia  
Tel. +385 1 5502 931  
Fax. +385 1 5502 902  
e-mail: [jasminka.radovic@dzzp.hr](mailto:jasminka.radovic@dzzp.hr)

Eugen Draganović  
Ministry of Environmental and Nature Protection  
Nature Protection Directorate  
Republike Austrije 14  
HR - 10000 Zagreb  
Republic of Croatia  
Tel. +385 1 4866 110  
Fax. +385 1 4866 100  
e-mail: [eugen.draganovic@min-kulture.hr](mailto:eugen.draganovic@min-kulture.hr)

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Designation date

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Site Reference Number

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### 2. Date this sheet was completed/updated:

June, 2012

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### 3. Country:

Croatia / Republic of Croatia

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#### 4. Name of the Ramsar site:

The precise name of the designated site in one of the three official languages (English, French or Spanish) of the Convention. Alternative names, including in local language(s), should be given in parentheses after the precise name.

Crna Mlaka (Crna Mlaka Fishponds)

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#### 5. Designation of new Ramsar site or update of existing site:

This RIS is for (tick one box only):

- a) Designation of a new Ramsar site ; or  
b) Updated information on an existing Ramsar site

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#### 6. For RIS updates only, changes to the site since its designation or earlier update:

##### a) Site boundary and area

The Ramsar site boundary and site area are unchanged:

or

If the site boundary has changed:

- i) the boundary has been delineated more accurately ; or  
ii) the boundary has been extended ; or  
iii) the boundary has been restricted\*\*

and/or

If the site area has changed:

- i) the area has been measured more accurately ; or  
ii) the area has been extended ; or  
iii) the area has been reduced\*\*

\*\* **Important note:** If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

##### b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:

- **Application of the Criteria**

There was no update of the RIS since designation of the site in 1993. There is a significant amount of new information available today, allowing more precise application of previous Criteria from 1990 as well as of revised Criteria adopted in 2005.

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#### 7. Map of site:

Refer to Annex III of the *Explanatory Note and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

##### a) A map of the site, with clearly delineated boundaries, is included as:

see Appendix 1 (hard copy) and Appendix 2 (CD with JPEG and GIS file)

- i) a hard copy (required for inclusion of site in the Ramsar List): ;  
ii) an electronic format (e.g. a JPEG or ArcView image) ;  
iii) a GIS file providing geo-referenced site boundary vectors and attribute tables .

**b) Describe briefly the type of boundary delineation applied:**

e.g. the boundary is the same as an existing protected area (nature reserve, national park, etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

The boundary is identical to the boundary of existing protected area (two special ornithological reserves). The line follows the outer edge of fishpond banks, including additionally one management unit of adjacent alluvial forest.

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**8. Geographical coordinates** (latitude/longitude, in degrees and minutes):

Provide the coordinates of the approximate centre of the site and/or the limits of the site. If the site is composed of more than one separate area, provide coordinates for each of these areas.

Approximate centre: 45° 36' 40" N, 15° 44' 9" E

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**9. General location:**

Include in which part of the country and which large administrative region(s) the site lies and the location of the nearest large town.

Crna Mlaka is situated in NW part of Croatia, in the middle of the lowland basin along the Kupa River, named Pokupski Bazen (Kupa Basin). Kupa River is one of the largest Croatian rivers. It is 296 km long, starting in the mountain area of Gorski Kotar. It flows towards NE, partly forming the border with Slovenia. Entering the lowland, it forms extensive basin almost completely covered with the complex of alluvial oak forests.

The Ramsar site belongs to the territorial unit of Zagreb County and is located very close to Zagreb – the capital of Croatia (cca 23 km straight line distance to the NE). Cca 18 km straight line distance towards the SW the town of Karlovac is situated, representing the center of neighboring Karlovac County. The closest smaller town is Jastrebarsko (cca 8 km straight line distance to the NW). Crna Mlaka fishponds also contain a small settlement with only 30 inhabitants. While the whole Croatia, according to 2011 inventory (Croatian Bureau of Statistics, 2011) has 4,290,612 inhabitants on its territory of 56,550 km<sup>2</sup>, Zagreb has 792,875 inhabitants, Karlovac 55,981 and Jastrebarsko 15,897 inhabitants.

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**10. Elevation:** (in metres: average and/or maximum & minimum)

Average: 110.47 m (min 110 – max 115 m)

**11. Area:** (in hectares)

756.2 ha

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**12. General overview of the site:**

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

**Crna Mlaka is an area of extensive carp fishponds** that represent important breeding, feeding and staging/stop-over site for number of wetland species, especially birds. Fishponds have been protected in 1980 as ornithological reserve with the area of 693.96 ha, due to its value for migratory and breeding birds. Apart from fishponds, the Ramsar site includes 62.27 ha of adjacent **alluvial forest** that has been protected in 1967 as ornithological reserve "Jastrebarski lugovi" because of recorded breeding of the White-tailed Eagle (*Haliaeetus albicilla*) and the Lesser Spotted Eagle (*Aquila pomarina*). The stands here are 150 years old. In the middle of fishpond area there is a small settlement Crna Mlaka with 30 inhabitants, 16 of them being employed in fishery organization "IHOR Park Crna Mlaka".

Crna Mlaka is surrounded by a **large complex of alluvial oak forests**, one of the largest in Croatia and the whole Europe, covering the lowland basin **Pokupski Bazen** that stretches over more than 30,000 ha. It represents the alluvial wetland along the lower part of the Kupa River and its tributaries that flow in from adjacent hills of Samoborsko Gorje and Vukomeričke Gorice. In this forest complex composed mostly of the Common oak (*Quercus robur*) and the Narrow-leaved Ash (*Fraxinus angustifolia*) there are three carp fishponds: Crna Mlaka, Draganići and Pisarovina. The whole area of Pokupski Bazen was proclaimed the site of National ecological network by the Government of Croatia in 2007 (Official Gazette No 109/07). It is also a proposed NATURA 2000 site as well as Important Bird Area (IBA) according to the BirdLife International (see the map in Appendix 1).

Crna Mlaka fishponds with its water surface, extensive marsh vegetation and rich food resources (fish, fish food, plants) represent **important site for migratory and breeding waterbirds**. Although artificially made it has the role and values of natural wetland. Altogether around 250 bird species have been registered so far in Pokupski Bazen and out of it even 204 in Crna Mlaka ornithological reserve (Institute for Ornithology, 2003). The most of them are waterbirds but fishponds are also important for some forest breeders that feed on fishponds, like the White-tailed Eagle (*Haliaeetus albicilla*), the Black Stork (*Ciconia nigra*) and the Lesser Spotted Eagle (*Aquila pomarina*). The Otter (*Lutra lutra*) and the Beaver (*Castor fiber*) also inhabit fishponds. Regarding migratory waterbirds, Crna Mlaka has an exceptional importance for the Ferruginous Duck (*Aythya nyroca*). In post-breeding period and during the fall migration (August – October) this becomes the site with the largest congregation of the Ferruginous Duck in middle Europe, ranging up to 6,700 individuals (Institute for Ornithology, 2010). This represents more than 10% of E Europe, E Mediterranean and Black Sea biogeographical population of the Ferruginous Duck (Wetlands International, 2006). Together with other waterbirds, Crna Mlaka supports up to 15-20,000 birds during the fall migration. In combination with two adjacent fishponds, the Pokupski Bazen area regularly supports more than 20,000 migratory waterbirds (Radović et al., 2005).

The fact that Crna Mlaka is the only site in Pokupski Bazen where hunting is forbidden contributes to its ornithological value and high numbers of staging birds. Human activities in ornithological reserve include **fish production**, cca 80% of it being the Common Carp (*Cyprinus carpio*) as well as poorly developed recreational fishing and eco-tourism. Adjacent forest is being managed by the state forest company according to 10-years forest management plans.

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### 13. Ramsar Criteria:

Tick the box under each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11). All Criteria which apply should be ticked.

1	•	2	•	3	•	4	•	5	•	6	•	7	•	8	•	9
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### 14. Justification for the application of each Criterion listed in 13 above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

#### Criterion 2

A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or threatened ecological communities.

**Crna Mlaka** supports some ecological communities (**habitat types**) as well as a number of species that are threatened and/or of EU and European concern for protection. Habitat types protected by the EU Habitats Directive that are well represented on this site are:

- 3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea
- 3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation
- 91F0 Riparian mixed forest of *Quercus robur*, *Ulmus laevis* and *Ulmus minor*, *Fraxinus excelsior* or *Fraxinus angustifolia* along the great rivers (*Ulmenion minoris*).

Surrounding area of **Pokupski Bazen** additionally supports following **forest habitat types**:

- \*91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) - \* indicates a priority habitat type for protection
- 9160 Sub-Atlantic and medio-European oak or oak-hornbeam forests of the *Carpinion betuli*

Alluvial forests in Pokupski Bazen represent one of the few large complexes of the Common oak (*Quercus robur*) in Croatia and the whole Europe (for more details see chapter 20. General ecological features).

According to the IUCN Red List of Threatened Species (IUCN, 2011), Crna Mlaka with surrounding area does not support any of globally threatened species in categories CR, EN or VU. Anyway, it is important site for a number of **species of European concern** that are protected by the Birds Directive and the Habitats Directive as well as by the Bern Convention on the conservation of European wildlife and natural habitats (State Institute for Nature Protection, NATURA 2000 database). These include: the Four Leaf Clover (*Marsilea quadrifolia*), the Otter (*Lutra lutra*), the Beaver (*Castor fiber*), the Yellow-bellied Toad (*Bombina variegata*), the Italian Crested Newt (*Triturus carnifex*), the European Pond Turtle (*Emys orbicularis*), the Cerambyx Longicorn (*Cerambyx cerdo*), the Stag Beetle (*Lucanus cervus*) and the Rosalia Longicorn (*Rosalia alpina*). For more details see chapters 21. Noteworthy flora and 22. Noteworthy fauna.

**Important bird species** on fishponds include (Croatian Ornithological Society, 2011a): the Ferruginous Duck (*Aythya nyroca*), the Whiskered Tern (*Chlidonias hybridus*), the Little Bittern (*Ixobrychus minutus*), the Black Kite (*Milvus migrans*), the Little Crake (*Porzana parva*) and others (see chapter 22). The site is also important for some non-waterbirds that breed in immediate surroundings of Crna Mlaka like the White-tailed Sea Eagle (*Haliaeetus albicilla*), the Black Stork (*Ciconia nigra*), the Lesser Spotted Eagle (*Aquila pomarina*) and others.

Crna Mlaka is the most important site in middle Europe for post-breeding dispersion and fall migration of **Ferruginous Duck** (*Aythya nyroca*).

**Wider area of Pokupski Bazen** supports also some other species of European concern for protection like the White Stork (*Ciconia ciconia*), the Corncrake (*Crex crex*), the Middle Spotted Woodpecker (*Dendrocopos medius*) and the Collared Flycatcher (*Ficedula albicollis*).

### **Criterion 3**

A wetland should be considered internationally important if it supports populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region.

Exact number of species occurring on Crna Mlaka is not known, except for birds. Anyway, information collected so far regarding habitat types, animals and plants indicate that this relatively small fishpond area is one of the most important sites regarding **species richness and biodiversity** in

the western part of lowland Croatia and also important on the level of the southern part of the Continental biogeographical region (European Commission, 2011) (for more details see chapters 20-22). Comparing to around 250 bird species registered in Pokupski Bazen (cca 35,000 ha), on fishponds Crna Mlaka even 204 bird species have been registered, out of that 98 being birds of wetland habitats and 74 forest species (Institute for Ornithology, 2003). Apart from high number of species, Crna Mlaka is famous for **high concentrations of waterbirds during post-breeding period and fall migrations**. Rich water and amphibian vegetation represent valuable wetland habitats on artificial water bodies that significantly contribute to the function of natural wetlands on national and European level.

#### **Criterion 4**

A wetland should be considered internationally important if it supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions.

Crna Mlaka supports many waterbird species in significant numbers during critical stages in their life cycles, especially **migratory waterbirds** during the fall migration (Central European Flyway) (Institute for Ornithology, 2003). It is one of the most important stop-over sites for migratory waterbirds in Croatia and the most important site in middle Europe for the Ferruginous Duck (*Aythya nyroca*) during its post-breeding dispersion and the fall migration. With its rich water and marsh vegetation Crna Mlaka represents important **breeding site** for number of species. It is also valuable **feeding place** especially for ichthyophagous species and also provides **refuge for wintering birds** as long as fishponds are not frozen.

#### **Criterion 5**

A wetland should be considered internationally important if it regularly supports 20,000 or more waterbirds.

Crna Mlaka in boundaries of the Ramsar site supports up to 15,000-20,000 migratory waterbirds but there is no data that would indicate that this number is regularly  $\geq 20,000$ . Anyway, the whole **complex of Pokupski Bazen** that is proposed NATURA and IBA site, containing two more close-by fishponds apart from Crna Mlaka (Draganići and Pisarovina), satisfies this criterion, **regularly supporting  $\geq 20,000$  migratory waterbirds** (Radović et al., 2005). These birds are distributed among three fishponds but the largest numbers concentrate on Crna Mlaka. Being the ornithological reserve with no hunting allowed, it represents a refuge area for the most of migratory birds.

#### **Criterion 6**

A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.

Crna Mlaka regularly supports more than 1% of the E European, E Mediterranean and Black Sea population of the Ferruginous Duck (*Aythya nyroca*) that breeds in Eastern Europe (Wetlands International, 2006) during post-breeding dispersion and the fall migration (August-October). Monitoring of this species on Crna Mlaka from 2002 – 2011 registered from min. 2,617- max. 6,658 ind. (Croatian Ornithological Society, 2011 b) (for more details see chapter 22. Noteworthy fauna).

As 1% threshold for E European, E Mediterranean and Black Sea population is 450 ind., it is evident that Crna Mlaka regularly supports even **more than 10% of this Ferruginous Duck population.**

**15. Biogeography** (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

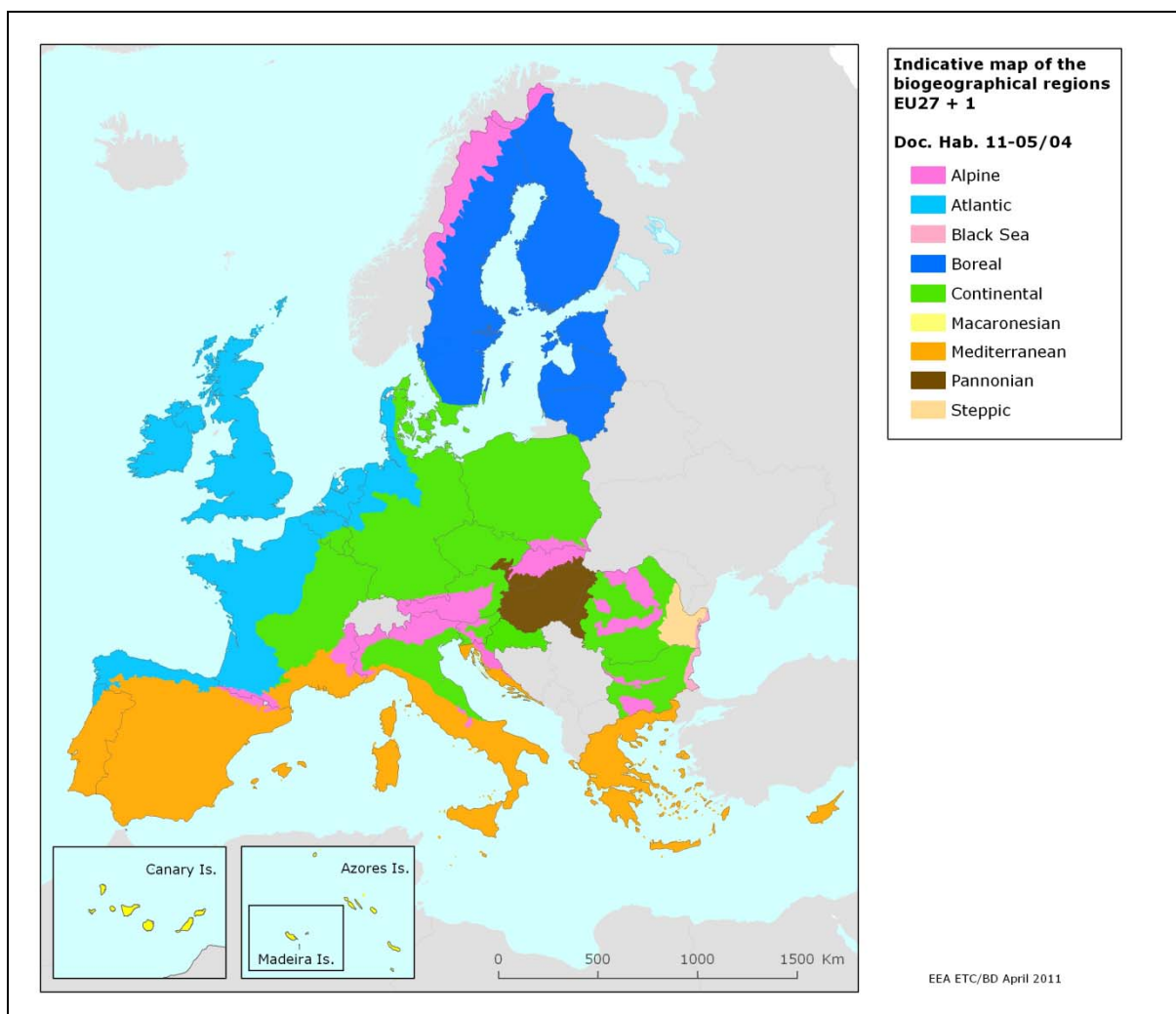
Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) **biogeographic region:**

Continental biogeographic region of EU and Europe

b) **biogeographic regionalization scheme** (include reference citation):

EU biogeographic regionalization, in accordance with the Habitat Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora). Reference: European Commission (2011): Map of EU biogeographic regions EU 27+1, Doc.Hab. 11-05/04



**16. Physical features of the site:**

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Crna Mlaka fishponds are situated in the middle of Pokupski Bazen that is the lowland alluvial area along the Kupa River. This central part of Pokupski Bazen is called **Tectonic depression of Crna Mlaka** (Vukelić et al., 2005) and represents the lowest part of the whole wider area (Zagreb County). Because of depression and the high underground water level, here is developed **clay alluvial soil**, highly dependent on water regimen.

Fishponds have been **artificially made in 1905** after clearing the part of alluvial oak forest complex of Pokupski Bazen. A number of ponds have been dug in depression of Mala Mlaka, between watercourses of Okićnica on the west and Brebernica on the east. Several small watercourses supply fishponds with water. In the middle of fishponds their first owner has built a castle called "Ribograd" ("Fishtown") in the style of Viennese Secession, which has been designated as national monument of **cultural heritage**. In this core area of Crna Mlaka there is a **small settlement** where traditionally the employees of fishery organization live with their families. Crna Mlaka is probably the most representative example of typical carp fishponds built in the alluvial oak forest in Croatia.

Continental Croatia with lowland forests has a moderate warm and rainy climate characterized by diversity of meteorological fluctuations and frequent and intensive changes of weather throughout the year. According to the Köppen classification system, the "cfwbx climatic type" is represented here. **Climate characteristics** of this area are (Zagreb County, 2002): annual precipitations range from 800 – 900 mm and are relatively evenly distributed during the year; the least precipitation is in winter while the rainfall maximum is in spring (June), late summer (September) and autumn (October – November); the air temperature ranges between -3°C and +22 °C while the humidity is largest in winter (average of 87%) and the minimum is in summer (average of 74%); the winter is characterized by frequent fog and NE winds while warm and humid winds blow during the spring.

**Hydrology** of fishponds depends on several small watercourses: Okićnica – flowing from near-by hills of Samoborsko Gorje (Plešivica) and bordering the western part of fishponds; Brebernica – flowing from hills of Vukomeričke Gorice to the eastern part of fishponds, with its tributaries Lipovec and Botića. Additionally, the small river of Volavčica is flowing from SW. All these watercourses are entering the larger Kupčina River that flows into the canal Kupa -Kupa and finally into the Kupa River.

Generally, water in fishponds should be cca 1.5 m deep that is optimal for fish production. Anyway, during last years the problem of lack of water is constantly growing because watercourses that fishponds depend on have been captured and used for water supply of near-by settlements. On different ponds there are **fluctuations of water level** depending on fish production technology. These fluctuations contribute to diversity of vegetation and species of the site. On ponds that are being emptied (usually for couple of months), amphibious vegetation develops. Migrating waders feed in fresh mud while herons, spoonbills, storks and other waterbirds use small ponds remained in depressions of emptied fishpond. Some ponds have well developed marsh vegetation (reedbeds, water vegetation, willows along the dams) that are also important breeding, feeding and hiding habitats for many species. Ponds that have been cleared from overgrowing vegetation, deepened and filled with the high water, become convenient for ducks, coots, grebes, geese, cormorants and other waterbirds. These are also hunting areas of the White-tailed Eagle that feeds on fish and waterbirds.

**Water in ponds is mainly eutrophic** due to fish production activities, especially fish feeding.

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**17. Physical features of the catchment area:**

Describe the surface area, general geology and geomorphological features, general soil types, and climate (including climate type).

Physical features of the catchment area are mostly the same as already mentioned for the Crna Mlaka site in Chapter 16. The area of Pokupski Bazen represents the most extensive depression along the Kupa River and collects a number of watercourses flowing from adjacent hills into the Kupa River or its tributaries. It was formed by tectonic movements and by alluvium material up to 10 m deep, which was drifted through time by water. The soil of such relief depressions is eugley, very heavy soil, saturated with water for the most part of the year. The forest composed mostly of the Common Oak (*Quercus robur*) and the Narrow-leaved Ash (*Fraxinus excelsior*) has developed in this depression, while the Black Alder (*Alnus glutinosa*) inhabits micro-depressions with staging water and high level of underground water.

Some climate related data of wider area is available from meteorological station in near-by town of Jastrebarsko, some 8 km straight line from Crna Mlaka fishponds. According to 10-year monitoring results, annual average humidity is 82% while monthly/annual precipitations in mm are as follows (Zagreb County, 2002):

Meteorological station	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	Annual	In veget. period
Jastrebarsko	60	62	68	59	77	110	75	83	87	86	87	48	900	489 (54%)

The area of Zagreb County is cloudy with average of 47 sunny days and 130 cloudy days. Annual average of insolation is 1,794 hours. Number of days with the strong wind ranges from 4-47 during the year.

**18. Hydrological values:**

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

Hydrological values of wider area of Crna Mlaka (Pokupski Bazen) are connected to the catchment area of the Kupčina River (621 km<sup>2</sup>), a tributary of the Kupa River. Kupa makes the southern border of Pokupski Bazen ecological network site. A number of smaller watercourses are flowing from adjacent hills of Žumberak and Plešivica (NW of Pokupski Bazen) and Vukomeričke Gorice (NE of Pokupski Bazen) and entering Kupčina River. It flows into artificial canal of Kupa-Kupa that cuts through Pokupski Bazen and the Kupa River in its SE part. Watercourses coming from Samoborsko Gorje have been cut in early 1970's with the highway Zagreb-Karlovac (NW border of Pokupski Bazen), their water being collected into the canal along the highway and transferred into the Kupa-Kupa canal. For the purpose of fishpond water supply, a passage under the highway was left, allowing watercourses of Okićnica and Gonjava to reach fishponds directly.

Depressions in Pokupski Bazen are being flooded during abundant rainfall and the whole area has a significant **role in flood control as a natural retention**.

The fishponds have a primary **role of fish production** and they are using the water from near-by watercourses. Fish production is highly dependent on their water. As they are being more and more used for water supply of settlements and in the same time the climate in this part of Europe becomes dryer, the shortage of water supply becomes an ever-growing problem for fishponds and fish production.

The significant **ecological role** of fishponds is that they represent artificial wetlands extremely valuable for large number of wetland species and habitat types.

## 19. Wetland Types

### a) presence:

Circle or underline the applicable codes for the wetland types of the Ramsar "Classification System for Wetland Type" present in the Ramsar site. Descriptions of each wetland type code are provided in Annex I of the *Explanatory Notes & Guidelines*.

Marine/coastal: A • B • C • D • E • F • G • H • I • J • K • Zk(a)

Inland: L • M • N • O • P • Q • R • Sp • Ss • Tp • Ts • U • Va •  
Vt • W • Xf • Xp • Y • Zg • Zk(b)

Human-made: 1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • Zk(c)

### b) dominance:

List the wetland types identified in a) above in order of their dominance (by area) in the Ramsar site, starting with the wetland type with the largest area.

1 - Aquaculture ponds - 563 ha

Xf – Freshwater, tree-dominated wetlands – 62.5 ha

M – Permanent rivers/streams/creeks

9 - Canals

## 20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

Generally speaking, **Crna Mlaka** contains two main groups of habitat types: fishponds with water and marsh vegetation as well as alluvial wet forests.

As mentioned in Chapter 2, important habitat types listed in Annex I of the EU Habitats Directive (HD) are:

### **3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea**

or according to European EUNIS classification (EEA):

#### **C3.4 Species-poor beds of low-growing water-fringing or amphibious vegetation**

This amphibian vegetation develops along the edge of fishponds that are periodically being emptied. When a pond is empty, amphibian vegetation develops in the wet contact zone or on the pond bottom that is still wet or contains remained water in small depressions. This vegetation is represented with two associations:

- *As. Cyperetum flavescens* W. Koch 1926 em. Aichinger 1933, with characteristic species the Yellow Galligale (*Cyperus flavescens*), the Water Purslane (*Ludwigia palustris*), the Needle Spikerush (*Eleocharis acicularis*) and others
- *As. Eleocharidi-Lindernietum* Pietsch 1973, with the Blunt Spikerush (*Eleocharis ovata*)

### **3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation**

According to EUNIS classification it corresponds with:

#### **C1.3 Permanent eutrophic lakes, ponds and pools**

##### **C1.32 Free-floating vegetation of eutrophic waterbodies**

##### **C1.33 Rooted submerged vegetation of eutrophic waterbodies**

Regarding vegetation types, several associations are included with dominance of different duckweeds (*Lemnaceae*) or with the European Frogbit (*Hydrocharis morsus-ranae*).

Crna Mlaka Ramsar site contains cca 60 ha of representative alluvial forest belonging to the HD class:

**91F0 Riparian mixed forest of *Quercus robur*, *Ulmus laevis* and *Ulmus minor*, *Fraxinus excelsior* or *Fraxinus angustifolia* along the great rivers (*Ulmenion minoris*).**

or corresponding EUNIS class:

**G1.22 Mixed [*Quercus*] - [*Ulmus*] - [*Fraxinus*] woodland of great rivers**

- The association developed in the Ramsar site is *Leucoio-Fraxinetum angustifoliae* Glavač 1959, with characteristic species being the Summer Snowflake (*Leucojum aestivum*) and the Narrow-leaved Ash (*Fraxinus angustifolia*).

Apart from these habitat types of conservation interest, Crna Mlaka contains other habitat types according to EUNIS classification (based on Udjbinac, 1959 and Alegro, 2010):

C1.24 Rooted floating vegetation of mesotrophic waterbodies

C1.31 Benthic communities of eutrophic waterbodies

C1.34 Rooted floating vegetation of eutrophic waterbodies

C3.65 Exposed unvegetated freshwater lake muds

D5 Sedge and reedbeds, normally without free-standing water

E2.2 Low and medium altitude hay meadows

E3.4 Moist or wet eutrophic and mesotrophic grassland

FA Hedgerows

I2 Cultivated areas of gardens and parks

J1 Buildings of cities, towns and villages

J5.41 Non-saline water channels with completely man-made substrate

**Surrounding alluvial forests in Pokupski Bazen** represent one of the largest remained complexes of the Common oak (*Quercus robur*) in Croatia and in Europe. Apart from already mentioned habitat type occurring in Crna Mlaka site (As. *Leucoio-Fraxinetum angustifoliae* Glavač 1959), this wider area additionally supports following forest habitat types:

From the HD class of **91F0**, the most of the oak forest complex is composed of:

- As. *Genisto elatae-Quercetum roboris* Ht. 1938 with characteristic species being the Common Oak (*Quercus robur*) and the Greenwood (*Genista elata*, syn. *G.tinctoria*)

More wet depressions of Pokupski Bazen contain European Alder forest of HD habitat type:

**\*91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) - \* indicates a priority habitat type for protection**

or EUNIS corresponding:

**G1.21 Riverine [*Fraxinus*] - [*Alnus*] woodland, wet at high but not at low water**

- As. *Frangulo-Alnetum glutinosae* Rauš 1968 with the Alder Bucktorn (*Frangula alnus*) and the European Alder (*Alnus glutinosa*)

- *As. Carici brizoidis-Alnetum glutinosae* Ht. 1938 with the Alder Bucktorn (*Frangula alnus*) and the sedge *Carex brizoides*

On somewhat higher localities, mostly out of reach of floods, the forest of the Common Oak (*Quercus robur*) and the European Hornbeam *Carpinus betulus*) is developed, belonging to the HD class:

**9160 Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli**

or EUNIS corresponding:

**G1.A1 [Quercus] - [Fraxinus] - [Carpinus betulus] woodland on eutrophic and mesotrophic soils**

- *As. Carpino betuli-Quercetum roboris* /Anić 1959/Rauš 1969

**21. Noteworthy flora:**

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 14. Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

On Crna Mlaka there is one species of European conservation concern, listed in Annex II of the Habitats Directive. It is **the Four Leaf Clover (*Marsilea quadrifolia*)** with European Red List status NT. It has been registered on fishponds of Pokupski Bazen (Alegro et al., 2010). This aquatic and semiaquatic fern is rare in Europe and is connected to the amphibious vegetation of HD habitat type “3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea” that mainly develops along the edge of fishponds that are periodically being emptied. This habitat type contains also some **other plant species that are rare/threatened on national level**, like the Blunt Spikerush (*Eleocharis ovata*), the Brown Galingale (*Cyperus fuscus*), a galingale (*Cyperus michelianus*), the Ricefield Bulrush (*Scirpus mucronatus*), the Spatulaleaf Loosestrife (*Lythrum portula*) and others (Alegro et al., 2010).

**22. Noteworthy fauna:**

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 14. Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Although in the area of Crna Mlaka and Pokupski Bazen there are no globally threatened species with IUCN status CR, EN or VU, there is a number of species of European conservation concern (European Red List status added along with the name of species) (State Institute for Nature Protection, NATURA 2000 database) .

From **non-avian species**, some are dependent on wetland and some on forest habitats. The most important species that represent target features of proposed NATURA 2000 site - Habitats Directive (HD) Annex II species:

**The Otter (*Lutra lutra*) – NT:** According to recent research and evaluation of sites important for this species in Croatia (Emys, 2009), the Pokupski Bazen area has an excellent value for conservation of the Otter and its habitats are considered to be well preserved. The population was estimated at 47 ind. That makes cca 3.5% of national population. Fishponds of Pokupski Bazen, including Crna Mlaka, are of outmost importance for this fish-feeding species. Otters are regularly being recorded on Crna Mlaka by fishery employees and researchers.

**The Beaver (*Castor fiber*) – LC:** The Beaver was reintroduced in Croatia in 1996, after it had become extinct from Croatia in the middle of 19<sup>th</sup> century. 85 animals released in several sites of Sava and Drava catchment area have spread relatively quickly throughout the north Croatia. Today the Beaver inhabits the whole Pokupski Bazen (Grubešić et al., 2008) and is regularly being observed on Crna Mlaka fishponds.

**The European Pond Turtle (*Emys orbicularis*) – NT** is common and numerous on Crna Mlaka fishponds.

**The Yellow-bellied Toad (*Bombina variegata*) – LC** and the **Italian Crested Newt (*Triturus carnifex*) – LC** use different water habitats on fishponds and in surrounding forest, like small ponds and canals. Both live in Pokupski Bazen area but the Italian Crested Newt was so far registered only on Draganići fishponds (Hyla, 2009).

An isolated population of the HD dragonfly species, the **Yellow-spotted Whiteface (*Leucorrhinia pectoralis*) – LC** was registered on Draganići fishponds situated few km NW from Crna Mlaka (Franković and Bogdanović, 2009).

Protected species of forest beetles (HD) that inhabit Pokupski Bazen are connected to old stands and deadwood. They include **the Cerambyx Longicorn (*Cerambyx cerdo*) – NT**, **the Stag Beetle (*Lucanus cervus*) – NT** and **the Rosalia Longicorn (*Rosalia alpina*) – LC**. Generally, the Rosalia Longicorn is mostly connected to the Beech forests but in the wet zone of alluvial forests (*Leucoio-Fraxinetum*), surprisingly rich population of this beetle was discovered in 2009 (Faculty of Forestry, 2009).

Regarding **ornithofauna**, Crna Mlaka supports significant number of birds under BirdLife categories of Species of European Concern (SPEC 2 and SPEC 3) (Burfield and van Bommel, 2004) and protected as the Annex I species of the Birds Directive (BD).

**Breeding populations of BD Annex I waterbirds on Crna Mlaka fishponds** that are important on national or international level are listed in the following table (Croatian Ornithological Society, 2011a).

Species	Common Name	Breeding popul.	Status in CRO	Nat. Red List			EU status	Global status
				B	S	W		
<i>Ixobrychus minutus</i>	Little Bittern	50-80 p.	B, S	NT			(Depleted)	
<i>Ciconia nigra</i>	Black Stork	2-15 ind.*	B, S	VU			Rare	
<i>Aythya nyroca</i>	Ferruginous Duck	70-80 p.	B, S	VU	NT		(VU)	NT
<i>Milvus migrans</i>	Black Kite	2 p.*	B	VU			(VU)	
<i>Haliaeetus albicilla</i>	White-tailed Eagle	2-3 p.*	B	EN			Rare	NT
<i>Circus aeruginosus</i>	Marsh Harrier	0-1 p.	B, S, W	EN				
<i>Porzana parva</i>	Little Crake	3-10 p.	B, S	DD				
<i>Chlidonias hybridus</i>	Whiskered Tern	0-200 p.	B, S	VU	NT		Depleted	

\*Individuals feeding on fishponds breed in adjacent forest  
Status: B – breeding; S – staging; W - wintering

Additionally, 3-5 pairs of **the Gadwall (*Anas strepera*)** breed on Crna Mlaka (Croatian Ornithological Society, 2011a). This is not the BD Annex I species but the breeding population of 40-50 pairs is threatened in Croatia (EN – Croatian Red List) (Institute for Ornithology, 2010).

There is a stable breeding population of **the Ferruginous Duck (*Aythya nyroca*)** on Crna Mlaka fishponds of 70-80 pairs (Croatian Ornithological Society, 2011c). Monitoring of this species in Pokupski Bazen in period 2004-2011 indicates significant fluctuations through years, probably depending on fishery production of three close-by fishponds (Draganići fishpond was not working for few years). The breeding population should be regarded on the level of whole Pokupski Bazen. It seems to be stable, fluctuating from 135-260 pairs.

**The Marsh Harrier (*Circus aeruginosus*)** and **the Whiskered Tern (*Chlidonias hybridus*)** are not regularly breeding. Monitoring of the Whiskered Tern in Pokupski Bazen from 2004-2011 (Croatian Ornithological Society, 2011d) shows that this species has bred on Crna Mlaka only in 2004 (100-130 p.) and in 2007 (200 p.). No breeding was registered during this period on other two near-by fishponds Draganići and Pizarovina.

**The Black Stork (*Ciconia nigra*), the White-tailed Eagle (*Haliaeetus albicilla*) and the Black Kite (*Milvus migrans*)** breed in forests of Pokupski Bazen and use Crna Mlaka fishponds for feeding. Out of 11 pairs of the White-tailed Eagle (*Haliaeetus albicilla*) registered for Pokupski Bazen in 2010 and 2011 (Croatian Ornithological Society, 2011e), 2-3 pairs are dependent on Crna Mlaka for feeding.

It should be noted that the breeding of **the Lesser Spotted Eagle (*Aquila pomarina*)** in the ornithological reserve of Jastrebarski Lugovi was not confirmed recently. The Pokupski Bazen area contains 4-6 pairs that make 6.6% of national breeding population (Institute for Ornithology, 2010).

Crna Mlaka is the site of utmost importance for **post-breeding dispersion and fall migration of Ferruginous Duck (*Aythya nyroca*)**, supporting more than 10% of E Europe, E Mediterranean and Black Sea biogeographical population (1% threshold is 450 ind. according to WPE4 of Wetlands International, 2006). This is the largest congregation of migratory population of this species in middle Europe. Results show relatively large fluctuations but there is no significant decline through years. It must be noted that in wider area of Pokupski Bazen there are three fishponds and that in some years these congregations are divided between them (mostly between Crna Mlaka and Draganići fishponds).

Registered numbers during monitoring in period 2002-2011 are as follows (Croatian Ornithological Society, 2011b):

Crna Mlaka	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Individuals	5,181	3,563	-	6,658	5,918	3,534	2,617	3,800	-	2

In 2004 and 2010 there was no monitoring and in 2011 for the first time there were no congregations of the Ferruginous Duck on fishponds of Pokupski Bazen with any obvious reason.

There are **12 bird species** listed in Annex I of the Birds Directive that represent trigger species (**bold**) of proposed NATURA 2000 (SPA) and IBA site **Pokupski Bazen**, 5 of them in addition to birds mentioned for Crna Mlaka. Populations of BD Annex I species in Pokupski Bazen are estimated as follows (Institute for Ornithology, 2010):

Species	Common name	Status			Breeding Min. - Max.		% of nat.pop.	Staging min.-max.		Wint. min-max		% of nat.pop.
Acrocephalus melanopogon			S									
Alcedo atthis		B			20	30	2.86					
<b>Aquila pomarina</b>	<b>Lesser Spotted Eagle</b>	<b>B</b>			<b>4</b>	<b>6</b>	<b>6.6</b>					
Ardea purpurea			S									
Ardeola ralloides			S									
Asio flammeus		B			0	3	20					
<b>Aythya nyroca</b>	<b>Ferruginous Duck</b>	<b>B</b>	<b>S</b>		<b>150</b>	<b>300</b>	<b>15</b>	<b>2600</b>	<b>6700</b>			
Botaurus stellaris		B	S	W	2	3	5					
<b>Chlidonias hybridus</b>		<b>B</b>			<b>0</b>	<b>200</b>						
Chlidonias niger			S									
<b>Ciconia ciconia</b>	<b>White Stork</b>	<b>B</b>			<b>55</b>	<b>75</b>	<b>5</b>					
<b>Ciconia nigra</b>	<b>Black Stork</b>	<b>B</b>	<b>S</b>		<b>10</b>	<b>13</b>	<b>4.5</b>					
Circus aeruginosus		B			1	2	2.5					
Circus cyaneus				W						20	30	2
Circus pygargus		B			1	3	1.6					
<b>Crex crex</b>	<b>Corncrake</b>	<b>B</b>			<b>20</b>	<b>80</b>	<b>2.8</b>					
<b>Dendrocopos medius</b>	<b>Middle Spotted Woodpecker</b>	<b>B</b>			<b>500</b>	<b>800</b>	<b>2.9</b>					
Dendrocopos syriacus		B			2	5	0					
Dryocopus martius		B			10	17	0.83					
Egretta alba			S	W						50	200	3.3
Egretta garzetta			S									
Erithacus svecica			S									
<b>Ficedula albicollis</b>	<b>Collared Flycatcher</b>	<b>B</b>			<b>3000</b>	<b>6000</b>	<b>5</b>					
Grus grus			S									
<b>Haliaeetus albicilla</b>	<b>White-tailed Eagle</b>	<b>B</b>			<b>9</b>	<b>11</b>	<b>6.67</b>					
<b>Ixobrychus minutus</b>	<b>Little Bittern</b>	<b>B</b>	<b>S</b>		<b>70</b>	<b>140</b>	<b>5.83</b>					
Lanius collurio		B			7000	9000	2.33					
Lanius minor		B			10	20	0.43					
<b>Milvus migrans</b>	<b>Black Kite</b>	<b>B</b>			<b>6</b>	<b>8</b>	<b>6.67</b>					
Nycticorax nycticorax			S									
Pernis apivorus		B			4	7	2.67					
Philomachus pugnax			S									
Picus canus		B			80	120	2.29					
Platalea leucorodia			S									
<b>Porzana parva</b>	<b>Little Crane</b>	<b>B</b>			<b>10</b>	<b>30</b>	<b>12.5</b>					
Porzana porzana		B			0	2						
Sterna hirundo			S									
Strix uralensis		B			7	10	2.25					
Sylvia nisoris		B			50	70	2.33					
Tringa glareola			S									

Status: B – breeding; S – staging; W - wintering

### 23. Social and cultural values:

a) Describe if the site has any general social and/or cultural values e.g., fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values:

Crna Mlaka has socio-economic importance on local and national level because of its role of **fish production** (mostly the Common Carp *Cyprinus carpio*). It is one of 14 carp fishponds in Croatia with extensive or semi-intensive production that contribute to nature protection as man-made wetlands with all values and functions of similar natural wetland habitats. It has also significance **for tourism, recreation, education and scientific research**, although these activities are not developed at larger scale. **Cultural value** of Crna Mlaka is connected to the castle "Ribograd" ("Fishtown") built by the first owner of fishponds Kornelius Zwilling at the beginning of 20<sup>th</sup> century. It is designed in the manner of Viennese Secession and protected as national cultural monument. Around the castle a very nice park was created, following the "British" style of horticultural parks. The castle and the park are situated in the middle of the fishpond area. They represent the core of the small settlement Crna Mlaka that occupies the area of cca 15 ha.

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning?

If Yes, tick the box  and describe this importance under one or more of the following categories:

- i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:
- ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:
- iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:
- iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

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### 24. Land tenure/ownership:

a) within the Ramsar site:

Crna Mlaka fishponds are being managed by the private firm "IHOR PARK Crna Mlaka" that owns the land and real estate on fishpond area and is engaged in fish production. Ponds with water (cca 563 ha) are state-owned and the firm has concession for water use. Adjacent forest is also state-owned (62.5 ha).

So out of the whole area of the Ramsar site (756.2 ha – 100%), the state owned area is cca 625.5 ha (82.7%) and the rest (cca 130.7 ha – 17.3%) is privately owned.



b) in the surrounding area:

The surrounding area of Crna Mlaka is covered with forests of Pokupski Bazen that are cca 3/4 state-owned while the rest is private. The other two fishponds (Draganići and Pisarovina) are being managed by private firms and have concession for water use, being owners of real estate on these sites. Forests of Pokupski Bazen are surrounded by agriculture land and few settlements. There is no data available on structure of ownership in this zone.

## 25. Current land (including water) use:

a) within the Ramsar site (see the map in Appendix 1):

The main land and water use in Crna Mlaka is connected to **fish production** on productive area of 520.69 ha. Previously the fishponds have been state-owned and run by the state company but in 1993 they have been privatized and the firm "IHOR PARK Crna Mlaka" was established. The firm has the concession for using the water of fishponds as well from watercourses Okićnica, Gonjeva, Lukavec and Brebernica for fish production. About 80% of fish production goes for the Common Carp (*Cyprinus carpio*) and the rest consists of the Grass Carp (*Ctenopharyngodon idella*), the Silver Carp (*Hipophthalmichthys moltrix*), the Wels Catfish (*Silurus glanis*), the Pike (*Esox lucius*), the Tench (*Tinca tinca*) and the Zander (*Stizostedion lucioperca*).

Production is extensive, ranging between 500 and 1000 t/ha per year. The fish is fed by natural food (grains) and not with pellets like in intensive production. The most of produced fish is exported to several European countries. Fish production faces a lot of problems. Besides economical ones, the most significant is the shortage of water because of regulation of watercourses that bring water into fishponds and their more intensive use for water supply of upstream settlements.

**Tourism and recreation** on Crna Mlaka are not well developed. In the lack of the management plan for ornithological reserve and financial support for such activities from county and state level, all initiative is still left to the fishery firm "IHOR PARK Crna Mlaka".

**Hunting** is forbidden in the ornithological reserve. **Forestry** is not important on the level of Crna Mlaka because this site contains only one department of the state-owned forest that is protected as ornithological reserve and not commercially exploited.

Traditionally, employees in fish production have been living in the **settlement** of Crna Mlaka. From 134 inhabitants in 1961, now days only 30 are living there, 16 of them being employed in fish production (Croatian Bureau of Statistics, 2011).

b) in the surroundings/catchment:

In the surrounding area the **fish production** is also important on two close-by fishponds (Draganići and Pisarovina). The most important activity in Pokupski Bazen is **forestry**. Except for the small part protected as ornithological reserve, forests are being exploited by the state-owned firm "Hrvatske šume" ("Croatian Forests"). Only about 1/4 of forests are privately-owned. **Hunting** is allowed in Pokupski Bazen, in forest and on fishponds except for the Crna Mlaka ornithological reserve. Forestry and hunting activities are based on forestry and hunting management plans that are being revised every 10 years. The whole Pokupski Bazen has an important role in the system of **flood-protection** as the natural retention.

**26. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:**

a) within the Ramsar site:

Ecological character of the site is directly connected with **fish production activities** so it is of utmost importance to keep production in current extensive way. Ceasing of production would in several years time result in significant changes of water regimen, vegetation and available food for wetland species, so complete ecological character of the site would be adversely affected.

One of the biggest problems on Crna Mlaka is **the lack of water** entering fishponds from adjacent watercourses and worsening of its quality. **Fish-feeding species** like different birds (the Cormorant, herons and others) and the Otter cause significant losses and damages to fish production. The system of incentive measures for fish production that contributes to nature protection should be agreed and systematically implemented in Croatia. For the last few years the carp fishponds in Croatia receive some subsidies and compensation for losses due to fish-feeding birds but it is not systematically connected to nature protection issues.

Effective **management** of ornithological reserve is not established. Nor the Government nor the responsible Zagreb County do not invest financial resources in protection of the site. There is no management plan developed for the site and complete management is left to the private fishery firm "IHOR PARK Crna Mlaka". Because of that the **tourism, recreation, promotion of the site, educational role and public awareness** activities are not developed in a way that an ornithological reserve and Ramsar site deserve.

**Forestry** activities in ornithological reserve adjacent to fishponds are restricted and there is no economic exploitation. Anyway, there was no recent evaluation of the site or nature protection management measures enacted.

The castle "Ribograd" that has a status of the **cultural monument** is in bad condition and there are no financial resources to restore it.

b) in the surrounding area:

Regarding **forestry** sector, nature conservation measures for biodiversity and especially important species are not yet systematically implemented. They should be agreed between sectors and incorporated in forestry management plans. Similar situation is also with **hunting**. Currently in Pokupski Bazen the most of old stands have been cut so young stands prevail. This situation affects directly the most threatened species that are usually connected to old forest and large quantity of deadwood.

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**Effective management**

**27. Conservation measures taken:**

a) List national and/or international category and legal status of protected areas, including boundary relationships with the Ramsar site:

In particular, if the site is partly or wholly a World Heritage Site and/or a UNESCO Biosphere Reserve, please give the names of the site under these designations.

**Crna Mlaka fishponds have been protected in 1980 as ornithological reserve** with the area of 693.96 ha, due to their value for migratory and breeding birds. Apart from fishponds, the Ramsar site includes 62.27 ha of adjacent alluvial forest that has been **protected in 1967 as ornithological reserve "Jastrebarski lugovi"** because of recorded breeding of the White-tailed Eagle (*Haliaeetus albicilla*) and the Lesser Spotted Eagle (*Aquila pomarina*).

Wider area of **Pokupski Bazen** that contains the whole Ramsar site, has been proclaimed a **site of National ecological network** in 2007 by the Government of Croatia ("Official Gazette" No 109/07).

The area is also **proposed as the site of EU ecological network NATURA 2000** (SPA – Special Protection Area for birds of BD Annex I) as well as **the Important Bird Area (IBA)** according to the BirdLife International criteria.

b) If appropriate, list the IUCN (1994) protected areas category/ies which apply to the site (tick the box or boxes as appropriate):

Ia ; Ib ; II ; III ; IV ; V ; VI

c) Does an officially approved management plan exist; and is it being implemented?:

Management plan for Crna Mlaka has not been developed yet.

d) Describe any other current management practices:

In two ornithological reserves hunting and economic exploitation of forests is forbidden. Fish production is implemented independently by the "IHOR PARK Crna Mlaka" without nature conservation measures incorporated in its documentation. General restrictions and procedures for issuing permits for planned projects and activities are proscribed by the Nature Protection Act ("Official Gazette" No 70/05; 139/08; 57/11).

Fishery, forestry and hunting in surrounding area of Pokupski Bazen are being implemented through sector management plans that are supposed to contain nature conservation measures approved by ministry responsible for nature protection. As this is the National ecological network site, all projects that could significantly influence its target features are subject to the procedure of nature impact assessment.

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## 28. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

- Develop management plan for Ramsar site/ornithological reserves;
- Ensure enough water for fish production and long-term existence of fishponds;
- Ensure more systematic engagement (financial and technical) in site management of the Public Institution for management of protected sites and other natural values in Zagreb County as well as of Governmental organizations
- Ensure the system of incentive measures (aqua-environment measures) for nature-friendly fish production, taking in mind losses caused to the fish production by fish-eating animals
- Develop sustainable tourism, recreation, promotion of the site, educational and public awareness activities
- Restore the protected cultural monument -the castle "Ribograd" in Crna Mlaka
- Restore bird watching towers; ensure educational trails and other facilities for visitors and researchers
- Incorporate nature conservation measures in forestry and hunting management plans for wider Pokupski Bazen area

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## 29. Current scientific research and facilities:

e.g., details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

Currently there are no facilities in Crna Mlaka for research purposes like field research station. Several bird-watching towers can be used for bird monitoring activities.

There are not many current research projects in Crna Mlaka. The only systematic work is done by the Croatian Ornithological Society since 2004, related to birds monitoring of the whole Pokupski Bazen that includes also annual monitoring in Crna Mlaka of breeding and post-breeding dispersal of the Ferruginous Duck (*Aythya nyroca*), breeding of the Whisked Tern (*Chlydonias hybridus*) as well as of breeding of the White-tailed Eagle (*Haliaeetus albicilla*) in Pokupski Bazen and using of fishponds for its feeding.

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

e.g. visitors' centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

CEPA activities related to Crna Mlaka are not well developed. Governmental organizations, the responsible Zagreb County and the Town of Jastrebarsko are occasionally included in promotion of the site. For last several years the celebration of the World wetlands day has been organized in Crna Mlaka by Croatian Governmental organizations (State Institute for Nature Protection and responsible Ministry) in co-operation with "IHOR PARK Crna Mlaka", including press releases, press conferences as well as educational guided tours for schools and other interested visitors. Visitor centre does not exist in the site but there are several bird-watching towers.

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**31. Current recreation and tourism:**

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

**Tourism and recreation** on Crna Mlaka are poorly developed. In the lack of the management plan for ornithological reserve and financial support from county and state level, the initiative is left to the fishery firm "IHOR PARK Crna Mlaka". Potential for such activities is very high, especially because Crna Mlaka is situated very close to Zagreb - the capital of Croatia as well as to the exit from the highway Zagreb – Karlovac. Currently the most visits to Crna Mlaka are paid by school excursions, ornithologists and anglers. Visits must be announced to the fishery firm because of EU veterinary sanitary regulations that are implemented here and request strict control of visitors on the entrance of fishpond area.

The situation regarding tourism and recreation could be improved with more promotion, investment in visitor's facilities and effective control of visitors on the entrance of fishponds related to veterinary safety regulations.

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**32. Jurisdiction:**

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept of Agriculture/Dept. of Environment, etc.

Territorial jurisdiction:

**Zagreb County**

Ulica grada Vukovara 72/V, 10 000 Zagreb

Phone: +385 1 6009 401

Fax: +385 1 6154 008

web: <http://www.zagrebacka-zupanija.hr/kontakt>

Sectoral jurisdiction:

**Ministry of Environmental and Nature Protection**

Ulica Republike Austrije 14, 10 000 Zagreb

Phone: +385 1 3782 111

Fax: +385 1 3717 149  
web: <http://www.mzoip.hr/>  
e-mail: [pr@mzopu.hr](mailto:pr@mzopu.hr)

**Ministry of Agriculture** (responsible also for forestry, fishery and water management)

Ulica grada Vukovara 78, 10000 Zagreb  
Phone: +385 6106 111  
Fax: +385 6109 201  
e-mail: [office@mps.hr](mailto:office@mps.hr)  
web: <http://www.mps.hr>

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**33. Management authority:**

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

**Fishery:**

IHOR-PARK Crna Mlaka Ltd  
Crna Mlaka 9, 10450 Jastrebarsko  
Phone: +385 1 3755799  
Fax: +385 1 3755810  
e-mail: [crna-mlaka@zg.htnet.hr](mailto:crna-mlaka@zg.htnet.hr)  
web: [www.crna-mlaka.htnet.hr](http://www.crna-mlaka.htnet.hr)

**Nature protection:**

Public Institution for management of protected sites and other natural values in Zagreb County –  
Green Ring of Zagreb County  
Office: Ivana Lučića 2a/13, 10 000 Zagreb  
Official address: Ulica grada Vukovara 72/V, 10 000 Zagreb  
Phone/fax: +385 1 6111 552  
e-mail: [ju@priroda-zagrebacka.hr](mailto:ju@priroda-zagrebacka.hr)  
web: [www.priroda-zagrebacka.hr](http://www.priroda-zagrebacka.hr)

**Forestry:**

“Croatian Forests” – Management unit Karlovac  
Put Davorina Trstenjaka 1, 47 000 Karlovac  
Phone: +385 47 843 200  
fax: +385 47 613 438  
e-mail: [karlovac@hrsume.hr](mailto:karlovac@hrsume.hr)

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**34. Bibliographical references:**

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 15 above), list full reference citation for the scheme.

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<http://www.dzpz.hr>

<http://www.priroda-zagrebacka.hr>

<http://www.zastita-prirode.hr>

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Please return to: **Ramsar Convention Secretariat, Rue Mauverney 28, CH-1196 Gland, Switzerland**  
Telephone: +41 22 999 0170 • Fax: +41 22 999 0169 • e-mail: [ramsar@ramsar.org](mailto:ramsar@ramsar.org)

## APPENDIX 1 – Maps

1. Boundaries of Crna Mlaka Ramsar site (consisting of two ornithological reserves) on topographic map 1: 25,000
2. Land use map of Crna Mlaka Ramsar site (Corine Land Cover)
3. Map of Pokupski Bazen (proposed NATURA 2000 site and Important Bird Area), including Crna Mlaka Ramsar site, on topographic map 1: 100,000