IUCN Conservation Outlook Assessment 2014 **(archived)**
Finalised on 28 September 2014

Please note: this is an archived Conservation Outlook Assessment for Srebarna Nature Reserve. To access the most up-to-date Conservation Outlook Assessment for this site, please visit https://www.worldheritageoutlook.iucn.org.

Srebarna Nature Reserve

SITE INFORMATION

Country:
Bulgaria
Inscribed in: 1983
Criteria:
(x)

Site description:
The Srebarna Nature Reserve is a freshwater lake adjacent to the Danube and extending over 600 ha. It is the breeding ground of almost 100 species of birds, many of which are rare or endangered. Some 80 other bird species migrate and seek refuge there every winter. Among the most interesting bird species are the Dalmatian pelican, great egret, night heron, purple heron, glossy ibis and white spoonbill. © UNESCO

SUMMARY

2014 Conservation Outlook

Good with some concerns

The majority of the values of the property enjoy good conservation status. There is an overall trend of improvement of the conservation status of most of the bird populations. However, when assessed against the best-recorded historical conservation state, the conservation status of the Squacco Heron and Black Tern has deteriorated. Additional information is needed to make reliable assessment of the conservation state of the Ruddy Shelduck, White-tailed, Corncrake, Lesser White-fronted Goose, and Fieldfare.
The current threats within the property and its buffer zone are likely to have local but reversible impacts. Most significant threats to the values of the property are related to the long-term effects of the on-going active management of its hydrological conditions. In the long-term the combined effects of climate change, the on-going accretion of sediments and unabated eutrophication may result in significant negative effects on the values and integrity of the property.
The current management system is adequate, but it may be insufficient to maintain the values and integrity of the property over the long-term. The principle challenges include law enforcement, involvement of local stakeholders in conservation management planning and implementation as well as timely planning and sustained conservation financing.

Current state and trend of VALUES

Low Concern
Trend: Data Deficient

The majority of the bird populations of the property enjoy good conservation status, and some of them have superseded their size at the time of inscription. However, when assessed against the best-recorded historical conservation state, the conservation status of the Squacco Heron (Ardeola ralloides) and Black Tern (Chlidonias niger) has also deteriorated. Furthermore, the conservation state of Ruddy Shelduck (Tadorna ferruginea), White-tailed Eagle (Haliaeetus albicilla),

Corncrake (Crex crex), Lesser White-fronted Goose (Anser erythropus), and Fieldfare (Turdus pilaris) could not be assessed reliably due to lack of or contradictory information.

Overall THREATS

Low Threat

Most significant threats to the values of the property are related to the on-going active management of the hydrological conditions in the property. The lack of proper maintenance and operation of the sluice gates at the Dragaika canal connecting the property with the Danube River jeopardizes the continuation of the water level regime prescribed by the management plan. Furthermore, the expected lowering of the water level in the Danube due to climate change is likely to disrupt the regular seasonal flooding of the property and potentially trigger significant ecological change. In the long-term the accretion of sediments is likely to result in accelerated eutrophication and significant negative impacts on multiple values and the integrity of the property. The combined effect of these threats is likely to impede the on-going recovery of the ecological conditions and values of the property. Illegal fishing and invasive alien species also have negative, though limited, impacts on the integrity and values of the property. The threats in the area beyond the property and the surrounding buffer zone pose additional risks to its values and the integrity, but currently their impacts are moderate and reversible.

Overall PROTECTION and MANAGEMENT

Mostly Effective

The legal and administrative arrangements for the protection of the values and integrity of the property and its buffer zone, as well as important adjacent areas in Bulgaria and Romania, are considered sufficiently effective. In this context, the boundaries of the property and its buffer zone are considered adequate. The current management system is adequate, but it may be insufficient to maintain the values and integrity of the property over the long-term. The principle challenges include law enforcement, involvement of local stakeholders in conservation management planning and implementation as well as timely planning and sustained conservation financing. The on-going research and monitoring activities represent an outstanding and exemplary model for sound

scientifically-based management of a World Heritage property.

FULL ASSESSMENT

Description of values

Values

World Heritage values

- **An important wetland on the Western Palaearctic bird migratory flyway**
  Criterion:(x)

  Srebarna Nature Reserve is an important wetland on the Western Palaearctic bird migratory flyway. It provides nesting grounds for 99 species of birds and seasonal habitat to around 80 species of migratory birds. The rich bird life supported by Srebarna Nature Reserve is the basis for its international significance. The property holds populations of birds that are considered critical to species survival (SoOUV, 2009).

- **Dalmatian Pelican, Pelecanus crispus**
  Criterion:(x)

  The property hosts the only breeding colony of the Dalmatian Pelican in Bulgaria (WHC 1983a, WHC 1983b, WHC 2009, Michev and Simeonov 2011, Michev and Kamburova 2012). The Dalmatian Pelican is classified by IUCN as globally threatened in the category Vulnerable (IUCN 2012). The population of this species in Bulgaria is classified in the category Critically Endangered (Michev and Simeonov 2011). The property hosts 100 % of the national breeding population: at the average, in the property there were 67 breeding pairs for the period 1954-2005 (Michev and Simeonov 2011) and 108 breeding pairs for the period 2007-2011 (Michev and Kamburova 2012). During the breeding season the colony forages in the adjacent wetlands along the Danube river in Romania: Lacul Mostiştea, Lacul Gălățui, Iezerul

Călăraşi and Ciocăneşti Dunăre (Michev and Kamburova 2012). Some 200 individuals stage at the property during the migration season (Michev and Kamburova 2012).

► Pygmy Cormorant, Phalacrocorax pygmeus

Criterion:(x)

The property hosts the largest and most stable breeding colony of the Pygmy Cormorant in Bulgaria (WHC 2009, Nikolov et al. 2011). Globally, the Pygmy Cormorant is classified by IUCN in the category Least Concerned (IUCN 2012) whereas the population in Bulgaria is classified in the category Endangered (Nikolov et al. 2011). The property hosts 180/60-300 breeding pairs, 37/3-70 wintering individuals and 9/2-17 individuals stage at the property during the migration season (EEA 2013). The bottom-growing reedbeds microhabitat, found in all costal parts of the Srebarna Lake, is the breeding habitat for the Pygmy Cormorant (Kambourova 2012).

► Ferruginous Duck, Aythya nyroca

Criterion:(x)

The property hosts the largest and most stable breeding colony of the Ferruginous Duck in Bulgaria (WHC 2009, Cheshmedziev 2012). Globally, the Ferruginous Duck is classified by IUCN in the category Near Threatened (IUCN 2012), whereas the population in Bulgaria is classified in the category Vulnerable (Petkov 2011). The property hosts 25-40 breeding pairs (>15% of the breeding population in Bulgaria; Cheshmedziev 2012); the number of wintering individuals is small (2). Data on number of individuals that stage in the property during the migration season vary

► Eurasian Spoonbill, Platalea leucorodia

Criterion:(x)

The Eurasian Spoonbill is a species of pan-European conservation importance - rare (BirdLife International 2004, WHC 2009). The population of this species is concentrated in Europe and has unfavourable conservation status at the pan-European level (BirdLife International 2004). Globally, the Eurasian Spoonbill is classified by IUCN in the category Least Concern (IUCN 2012). In Bulgaria this species is classified in the category Critically Endangered (Boev and Michev 2011). There are 20-24 breeding pairs in the

property and its buffer zone (100 -15% of the national population), and 18/7-30 individuals stage at the property during the migration season (EEA 2013).

► Glossy Ibis, Plegadis falcinellus

Criterion:(x)

The Glossy Ibis is a species of pan-European conservation concern - rare (BirdLife International 2004, WHC 2009). The population of the Glossy Ibis is not concentrated in Europe, but has unfavourable conservation status at the pan-European level (BirdLife International 2004). Globally, the Glossy Ibis is classified by IUCN in the category Least Concern; the population is decreasing (IUCN 2012). In Bulgaria this species is classified in the category Critically Endangered (Michev et al. 2011a). There are 19/10-28 breeding pairs in the property and its buffer zone and 100 wintering individuals (EEA 2013).

► Purple Heron, Ardea purpurea

Criterion:(x)

The Purple Heron is a species of European conservation concern (SoOUV, 2009). The population of the Purple Heron is not concentrated in Europe, but has unfavourable conservation status at the pan-European level (BirdLife International 2004). Globally, the Purple Heron is classified by IUCN in the category Least Concern; the population is decreasing (IUCN 2012). In Bulgaria this species is classified in the category Endangered (Boev et al. 2011). There are 8-50 breeding pairs in the property and its buffer zone.

► Ruddy Shelduck, Tadorna ferruginea

Criterion:(x)

The Ruddy Shelduck is a species of pan-European conservation concern (BirdLife International 2004, WHC 2009). The population of this species is not concentrated in Europe, but has unfavourable conservation status at the pan-European level (BirdLife International 2004). Globally, the Ruddy Shelduck is classified by IUCN in the category Least Concern (IUCN 2012). In Bulgaria this species is classified in the category Critically Endangered (Zehtindjiev et al. 2011). According to the EEA (2013), there are 2/0-4 breeding pairs in the property and its buffer zone, and 9/1-17 individuals stage at the property during the migration season. However, according to Zehtindjiev et al. (2011),

about half of the national breeding population inhabits the open terrains of Northeastern Bulgaria and the largest densities of breeding habitats are around the town of Glavinitsa, Silistra region. This species also breeds in the region around Burgas and in the microreservoirs near Karnobat and Aytos; the property is not mentioned as a current breeding site (Zehtindjiev et al. 2011).

► Little Bittern, Ixobrychus minutus

Criterion:(x)

The Little Bittern is a species of pan-European conservation concern (BirdLife International 2004, WHC 2009). The population of this species is not concentrated in Europe, but has unfavourable conservation status at pan-European level (BirdLife International 2004). Globally, the Little Bittern is classified by IUCN in the category Least Concern; the population is decreasing (IUCN 2012). In Bulgaria this species is classified in the category Endangered (Boev 2011a). There are 50/30-70 breeding pairs in the property and its buffer zone, which represents a small share of the national population (EEA 2013).

► Squacco Heron, Ardeola ralloides

Criterion:(x)

The Squacco Heron is a species of pan-European conservation concern - rare (BirdLife International 2004, WHC 2009). The population of this species is not concentrated in Europe, but has unfavourable conservation status at pan-European level (BirdLife International 2004). Globally, the Squacco Heron is classified by IUCN in the category Least Concern; the population is decreasing (IUCN 2012). In Bulgaria this species is classified in the category Endangered (Michev 2011a). There are 115/30-200 breeding pairs in the property and its buffer zone (15-2 % of the national population; EEA 2013).

► Little Egret, Egretta garzetta

Criterion:(x)

The Little Egret is a species of European conservation concern (SoOUV, 2009). The population of this species is not concentrated in Europe, and has otherwise favourable conservation status at the pan-European level (BirdLife International 2004). Globally, the Little Egret is classified by IUCN in the

category Least Concern; the population is increasing (IUCN 2012). In Bulgaria this species is classified in the category Vulnerable (Michev 2011b). There are 130/60-200 breeding pairs in the property and its buffer zone (EEA 2013).

► Great White Egret, Casmerodius albus

Criterion:(x)

The Great White Egret is a species of European conservation concern (SoOUV, 2009). The population of this species is not concentrated in Europe and has otherwise favourable conservation status at the pan-European level (BirdLife International 2004). Globally, the Great White Egret is classified by IUCN in the category Least Concern (IUCN 2012). In Bulgaria this species is classified in the category Critically Endangered (Michev 2011d). There are 7/2-12 breeding pairs in the property and its buffer zone (the only breeding population in Bulgaria), 2/0-5 wintering individuals, and 10 individuals stage at the property during the migration season (Kambourova 2005; EEA 2013).

► Whiskered Tern, Chlidonias hybridus

Criterion:(x)

The Whiskered Tern is a species of European conservation concern (SoOUV, 2009). The population of this species is not concentrated in Europe, but has unfavourable conservation status at pan-European level (BirdLife International 2004). In Bulgaria this species is classified in the category Vulnerable (Vasilev and Ivanov 2011). There are 120/40-200 breeding pairs in the property and its buffer zone, and 9/1-17 individuals stage at the property during the migration season (EEA 2013).

► Black Tern, Chlidonias niger

Criterion:(x)

The Black Tern is a species of European conservation concern (SoOUV, 2009). The population of this species is not concentrated in Europe, but has unfavourable conservation status at pan-European level (BirdLife International 2004). Globally, the Black Tern is classified by IUCN in the category Least Concern; the population is decreasing (IUCN 2012). In Bulgaria this species is classified in the category Critically Endangered (Ivanov 2011). There are 5/0-9 breeding pairs in the property and its buffer zone, and 1100 individuals stage at the property during the migration season

(EEA 2013).

► White-tailed Eagle, Haliaeetus albicilla

Criterion:(x)

The property was considered as a site of the largest breeding population of the White-tailed Eagle in Bulgaria (SoOUV, 2009). Globally, the White-tailed Eagle is classified by IUCN in the category Least Concerned (IUCN 2012), whereas the population in Bulgaria is classified in the category Vulnerable (Ivanov et al. 2011). According to EEA (2013), there is one breeding pair in the property and its buffer zone. However, other sources on the occurrence of this species on the territory of the property and its vicinity do not support this claim. For instance, Kambourova (2012) has not observed this species in the property or its vicinity during her ornithological study from 2004-2006. According to Ivanov (2007), a pair bred in the nearby islands of Vetren/Bialata (Romania) and Devnja (Bulgaria) in the Danube until 1967. Since late 1980s some individuals regularly rest in the island of Vetren and hunt in Lake Srebarna, indicating the presence of a breeding pair in the island of Vetren, that is, in the vicinity of the property, outside its buffer zone (Ivanov 2007).

► Corncrake, Crex crex

Criterion:(x)

The property was considered as a site of the largest breeding population of the Corncrake in Bulgaria (SoOUV, 2009). Globally, the Corncrake is classified by IUCN in the category Least Concerned (IUCN 2012), whereas the population in Bulgaria is classified in the category Vulnerable (Delov 2011). According to the EEA (2013) there are 3 breeding pairs in the property and its buffer zone. However, other sources on the occurrence of this species on the territory of the property and its vicinity do not support this claim. For instance, Kambourova (2012) has not observed this species in the property or its vicinity during her ornithological study from 2004-2006. According to Delov (2011), the more significant habitats of this species are found in the Sofia region, the Western and the Central Balkan range, Ponor Mountain, and along the Tran-Breznik line to the state border. The species has comparatively low numbers along the Danube banks and the Black Sea

coast, in Dobrudzha and the Eastern Rhodopes (Delov 2011).

▶ Greylag Goose, Anser anser

Criterion:(x)

The wintering population of the Greylag Goose has a notable presence in the property (SoOUV, 2009). The population of the Greylag Goose is not concentrated in Europe and has otherwise favourable conservation status at the pan-European level (BirdLife International 2004). Globally, the Greylag Goose is classified by IUCN in the category Least Concern; the population is increasing (IUCN 2012). In Bulgaria this species is classified in the category Endangered (Ivanov and Dereliev 2011). There are 3/2-5 breeding pairs in the property and its buffer zone, 43/20-800 wintering individuals, and some 500 individuals stage at the property during the migration season (EEA 2013).

▶ Red-breasted Goose, Branta ruficollis

Criterion:(x)

The property is a wintering site for the globally threatened Red-breasted Goose (WHC 2009). Globally, the species is classified by IUCN in the category Endangered (IUCN 2012). The population of this species in Bulgaria is classified in the category Vulnerable (Dereliev and Simeonov 2011). The property hosts less than 2% of the national wintering population (4/0-60 individuals; EEA 2013).

▶ Fieldfare, Turdus pilaris

Criterion:(x)

The wintering population of the Fieldfare has a notable presence in the property (SoOUV, 2009). The wintering population of the Fieldfare is concentrated in Europe and has favourable conservation status at the pan-European level (BirdLife International 2004). Globally, the Fieldfare is classified by IUCN in the category Least Concern; the population is stable (IUCN 2012). The property hosts less than 2% of the national wintering population – 7500 individuals (EEA 2013).

Other important biodiversity values

► Other bird species

The Saker Falcon is a species of global conservation concern. It is classified by IUCN as globally threatened in the category Endangered (IUCN 2012). The population of this species in Bulgaria is classified in the category Critically Endangered (Domuschiev et al. 2011). There are 0-1 breeding pairs in the property and its buffer zone (2-0 % of the national population; EEA 2013). The White Stork is classified in Bulgaria in the category Vulnerable (Petrov et al. 2011a). There are 2/1-3 breeding pairs in the property and its buffer zone (2-0 % of the national population), and 1000 individuals stage at the property during the migration season (EEA 2013). Black Stork is classified in the category Critically Endangered (Petrov et al. 2011b). There are 30 individuals in the property and its buffer zone during the migration season (between 2 and 0 % of the national population; EEA 2013). There are 15/10-20 breeding pairs of Lesser Grey Shrike in the property and its buffer zone (2-0 % of the national population; EEA 2013) and 1-2 breeding pairs of Wood Lark. Night Heron is classified in Bulgaria in the category Vulnerable (Michev et al. 2011b). There are 75/50-100 breeding pairs in the property and its buffer zone (15-2 % of the national population; EEA 2013). Eurasian Eagle Owl is a species of pan-European conservation importance. Globally, the Eurasian Eagle Owl is classified by IUCN in the category Least Concern; but the population is decreasing (IUCN 2012). In Bulgaria this species is classified in the category Endangered (Boev et al. 2011b). There is a pair which resides in the property and its buffer zone throughout the year (EEA 2013).

► Mammal species

The Eurasian Otter is a species of European conservation concern, classified in the category Near Threatened (Temple and Terry 2007). In Bulgaria this species is classified in the category Vulnerable (Spiridonov and Spassov 2011a). There are 6/7 resident individuals in the property and its buffer zone (EEA 2013). The Marbled polecat is a species of European conservation concern, classified in the category Vulnerable; the population trend is decreasing (Temple and Terry 2007). In Bulgaria the Marbled polecat is classified in the category Vulnerable (Spiridonov and Spassov 2011b). The property and its buffer zone host between 2-0 % of the national population

(EEA 2013).

► Amphibians and reptiles

The Hermann's Tortoise and the Spur-thighed Tortoise are both species of European conservation concern, classified in the category Vulnerable (Cox and Temple 2011). In Bulgaria these species are classified in the category Endangered (Beschkov 2011a). Both species are resident species in the property and its buffer zone (EEA 2013). The Danube Crested Newt is a species of European conservation concern, classified in the category Near Threatened; the population has a decreasing trend (Cox and Temple 2011). In Bulgaria this species is classified in the category Vulnerable (Beschkov 2011d). The Danube Crested Newt is a resident species in the property and its buffer zone (EEA 2013).

► Fish species

The Ukranian Stickleback is a species of European conservation concern, classified in the category Least Concerned. In Bulgaria this species is classified in the category Endangered (Stefanov and Trichkova 2011c). In Bulgaria the species has recently become extremely rare, showing a continuous decline of its range; the property hosts a significant share of the national population of the Ukranian Stickleback (Stefanov and Trichkova 2011c). The European Mudminnow is classified in Bulgaria in the category Critically Endangered (Stefanov and Trichkova 2011b). The European Mudminnow is a resident species and its population in the property and its buffer zone accounts for 15-2% of the national population (EEA 2013).

► Water-fan, Aldrovanda vesiculosa

The Water-fan is a species of European conservation concern (is classified in the category Data Deficient; Bliz et al. 2011). In Bulgaria this species is classified in the category Critically Endangered (Meshinev 2011).The property hosts the only population of the Water-fan in Bulgaria (EEA 2013, Meshinev 2011, Valchev et al. 2012).

Assessment information

Threats

Current Threats

Low Threat

A number of current threats to the values of the property are related to the on-going active management of the hydrological conditions in the property. The lack of proper maintenance and operation of the sluice gates at the Dragaika canal connecting the property with the Danube jeopardizes the continuation of the water level regime prescribed by the management plan. In addition, the existing hydrological regime for the property does not address the problem of sediment trapping which is further exacerbated by the delays in the implementation of actions for sediment removal envisaged in the management plan. The combined effect of the two threats is the unstable and delayed recovery of the ecological conditions and values of the property. This condition heightens the risks from other current and potential threats to the property, such as regular flooding from the Danube and the associated process of accelerated eutrophication. Another set of clear threats is related to poaching. Illegal fishing in particular persists as a threat to the values of the property, impacting both nesting and wintering birds and also food availability for fish-feeding birds. Invasive aliens species, such as the Grey Willow, and pressure from predators pose minor threat to the nesting colonies of some birds, most notably the Dalmatian Pelican and Pygmy Cormorant and are likely to be some localized but reversible negative impacts on these values and integrity of the property. The threats in the area beyond the property and the surrounding buffer zone pose additional risks to its values and the integrity, but currently their impacts are moderate and reversible.

▶ Housing/ Urban Areas

Low Threat

Outside site

The area around the property covered by human settlements with houses and yards has increased by 156% since 1948; the trend continues (Biserkov and Naumov 2012). These changes have had significant impact on habitats size and quality in the area around the property and its buffer zone (Biserkov and Naumov 2012). The current urbanized area is not habitable by many mammals, reptiles and amphibians (Biserkov 2012, Biserkov and Naumov 2012). These developments also affect the ecological connectivity of ecosystems in the property with those in the surrounding area. According to EEA (2013) urbanised areas and human habitation (including such effects as disturbance, resource use, noise and pollution which are threated here in other threat categories) have high, but neutral influence on the area around the property and its buffer zone.

► Tourism/ visitors/ recreation

Low Threat
Outside site

Recreation and tourism activities disturb the nesting population of the Spoonbill (Triplet et al. 2008). According to EEA (2013) walking and cycling have low and negative influence in small parts of the property and its buffer zone.

► Crop production

Low Threat
Outside site

Since 1948, the area around the property covered by non-irrigated farmland has increased by 919%; the trend continues (Biserkov and Naumov 2012). Those modifications and the consolidation of areas under cultivation have created marginally suitable or unsuitable habitats for the mammal, reptilian and amphibian populations around the property and its buffer zone (Biserkov 2012, Biserkov and Naumov 2012). Agricultural expansion affects the quality of habitat suitable for the Eurasian Spoonbill around the property and its buffer zone (Triplet et al. 2008). According to EEA (2013) agricultural cultivation (in general) has medium negative level of influence on some 5% of territory of the buffer zone of the property.

► Commercial hunting

Low Threat
Inside site
Outside site

Goose- and duck hunters often shoot from a pier or a boat on the Danube (CLGE 2001). The Greylag Goose is disturbed by hunters (Ivanov and Dereliev 2011).

► Crop production

Low Threat
Outside site

Since 1948, the area around the property covered by Vineyards has increased by 157%; the current trend is unknown (Biserkov and Naumov 2012). Those modifications have created marginally suitable or unsuitable habitats for the mammal, reptilian and amphibian populations around the property and its buffer zone (Biserkov 2012, Biserkov and Naumov 2012). Agricultural expansion affects the quality of habitat suitable for the Eurasian Spoonbill around the property and its buffer zone (Triplet et al. 2008). According to EEA (2013) agricultural cultivation (in general) has medium negative level of influence on some 5% of territory of the buffer zone of the property.

► Forestry/ Wood production

Low Threat
Outside site

The area under coniferous plantations around the property and its buffer zone has expanded significantly in the past (Biserkov and Naumov 2012). This has created marginally suitable or unsuitable habitats for the mammal, reptilian and amphibian populations around the property and its buffer zone (Biserkov 2012, Biserkov and Naumov 2012).

► Other

Low Threat

Impact from pig farms is due to agricultural expansion and intensification, that is, expansion of wheat/maize/sunflower farms (Triplet et al. 2008,

Biserkov 2012, Biserkov and Naumov 2012).

► Roads/ Railroads

Low Threat
Outside site

Since 1948, the area covered by the road and highway network (1st to 4th grade) in the area around the property has increased by 240%; the trend continues (Biserkov and Naumov 2012). This area is certainly no suitable as a habitat for all mammal, reptile and amphibian species present in the property and its surrounding area (Biserkov 2012, Biserkov and Naumov 2012). The gravel road around the property contributes to wildlife disturbance by noise, cars, recreationists and poachers (IUCN Consultation 2013). Concerning the measures for the protection of the Great Bittern in Bulgaria, Shurulinkov (2012) recommends speed reduction and control along the road from Silistra to Ruse, in the section close to the property. Infrastructure in general is mentioned as a threat to Eurasian Spoonbill (Triplet et al. 2008) and EEA (2013) reports high influence from transport networks in the area outside the property and its buffer zone, although this is classified as neutral.

► Other

Data Deficient

EEA (2013) reports high influence from electricity lines on the area outside the property and its buffer zone, although this is classified as neutral. No specific information is available on the effects of the values of the property.

► Fishing / Harvesting Aquatic Resources

Low Threat
Outside site

Many individuals of the Ferruginous Duck get entangled and drowned in fishnets while diving/foraging in the Danube or the neighbouring wetlands and fishponds in Romania (Cheshmedziev 2012). Due to commercial fishing in the area surrounding the property and its buffer zone, the quantity of fish available to waterfowl is reduced. This forces the birds to forage in other areas (e.g. in Romania) which is more energy demanding (IUCN Consultation 2013). According to EEA (2013) commercial fishing has high negative

influence in the area around the property and its buffer zone.

► Fishing / Harvesting Aquatic Resources

High Threat
Inside site
Outside site

Birds, otters and terrapins get entangled and drowned in fishnets while diving (Robinson and Hughes 2005, Cheshmedziev 2012, IUCN Consultation 2013, Birds in Bulgaria 2013). Due to illegal fishing in the property and its buffer zone, the quantity of fish available to waterfowl is reduced forcing some birds to forage in other areas (e.g. in Romania) which is more energy demanding (IUCN Consutlation 2013). Illegal fishing is a source of disturbance to the Greylag Goose (Ivanov and Dereliev 2011), Spoongbill (Triplet et al. 2008), other waterfowl (MoEW et al. 2012) and wildlife in general (IUCN Consultation 2013). The impact to waterfowl is particularly high during the nesting period (Cheshmedziev 2012). According to EEA (2013), trapping, poisoning, and poaching (including illegal fishing) have medium negative influence on 80% of the territory of the property and its buffer zone.

► Subsistence hunting

Low Threat
Outside site

The principal game species around the property and its buffer zone are the Wild Boar, Hare, Ring-necked Pheasant, Greylag Goose, and Quail (CLGE 2001). According to Ivanov and Dereliev (2011) hunting disturbs the Greylag Goose wintering population; poaching (including both illegal hunting and illegal fishing) as an important source of disturbance for all wildlife (IUCN Consultation, 2013).

► Fishing / Harvesting Aquatic Resources

Low Threat
Inside site
Outside site

Recreational fishing, in addition to illegal fishing in the property and its buffer zone, reduces the quantity of fish available to waterfowl and forces some birds to forage in other areas (e.g. in Romania) which is more energy

demanding (IUCN Consultation 2013).

► Other Biological Resource Use

Low Threat
Inside site
Outside site

In the past, one of the reasons for the decrease of bird species composition and abundance in the property were the direct and indirect toxic effects of rodenticides applied in 1989 (Michev et al. 1998). In 2003, three Lesser White-fronted Geese were found dead at Srebarna among 123 dead Greater White-fronted Geese; it is thought the birds had been poisoned by rodenticides, either in Bulgaria or Romania (Jones et al. 2008).

► Tourism/ visitors/ recreation

Low Threat
Outside site

Fishermen often improperly dispose plastic bags and other kinds of waste in the property, adding to the nutrient load of the lake (IUCN Consultation 2013).

► Storms/Flooding

High Threat
Inside site

The existing dykes along the Danube disturb the natural hydrological connectivity of the property with the river which triggered significant changes in the ecosystem (Triplet et al. 2008, Kalchev et al. 2010, IUCN Consultation 2013). In the long-term, the disturbance of the water regime could lead to deterioration and even loss of valuable habitats in the property (Kalchev et al. 2012, BSPB 2013). The seasonal flooding removes the sediments from the lake and maintains the riverine forests on the island (BSPB 2013). According to EEA (2013) dykes have high negative influence on some 60% of the property and its buffer zone. The hydrological connection of Lake Srebarna with the Danube is not optimal due to improper design and lack of maintenance of the sluice gates at the connecting canal Dragaika (Kabourova 2012, IUCN Consultation 2013).

► Dams/ Water Management or Use

Low Threat
Inside site
Outside site

The natural hydrology in the watershed of the property has been significantly modified through construction of 9 dams (Nikolova et al. 2010). According to EEA (2013) the modifying structures of inland water courses have medium negative influence on the area surrounding the property and its buffer zone.

► Dams/ Water Management or Use

High Threat
Outside site

The construction of Iron Gates dam lowered the river erosion basis and the frequency of (seasonal) flooding of the property which, in effect, disturbs the natural hydrological connectivity of the property with the river and has triggered significant changes in its ecosystem (Christensen and Rossler, 1998, Vasilev et al. 2012, IUCN Consultation 2013).

► Hyper-Abundant Species

Low Threat
Outside site

The pressure from predators (wild boars in particular, but also jackals, crows, foxes) account (partly) for the low success of the chicks of the Dalmatian Pelican at the property (destroying nests with eggs or killing chicks; Crivelli 1996, Triplet et al. 2008, Michev and Kamburova 2012). This has been (partly) resolved with the construction of artificial (wooden) platforms (Simeonov 2011).

► Water Pollution

High Threat
Inside site
Outside site

The eutrophication accelerates the process of succession of the lake ecosystem to swamp to mire to wet meadow (LT Konsult Ltd. 2012, Kamburova 2012). According to EEA (2013) eutrophication has high negative

influence on 50% of the territory of the property and its buffer zone.

► Solid Waste

Low Threat
Outside site

In 2003 began the construction of a treatment plant for the wastewater from Srebarna Village; it is not yet operational however. Furthermore, in case of high water level in the property, the effluent from the wastewater treatment may discharge into the lake and thus contribute to its eutrophication (IUCN Consultation 2013).

► Agricultural/ Forestry Effluents

Low Threat
Outside site

Nutrients from the pig farm near Kalnezha reach Lake Srebarna via the River Kalnezha and groundwater, and thus contribute to the eutrophication of the lake (RIS 2002, Kraleva et al. 2012, IUCN Consultation 2013).

► Agricultural/ Forestry Effluents

Low Threat
Outside site

Nutrients and pesticides from the farms throughout the watershed reach Lake Srebarna via surface water (e.g. the River Kalnezha) and groundwater, and thus contribute to its eutrophication (RIS 2002, Kraleva et al. 2012, IUCN Consultation 2013). According to EEA (2013) water pollution has low negative influence on some 50% of the territory of the property and its buffer zone and medium negative influence in their surrounding areas.

► Dams/ Water Management or Use

High Threat
Inside site
Outside site

There are conflicting arguments for the current water level management. The maintenance of the water level of the Lake “in a state closest to the maximum level” (CLGE 2001), negatively affects the lifecycle of amphibians, water snakes and terrapins (Biserkov and Naumov 2012). Also it negatively

affects the lifecycle of rodents which in turn affects the mammalophagous predators, such as the marbled polecat, the eastern fourlined ratsnake and the owls (Biserkov 2012). However, the significant fluctuation of the water level in the property enables the expansion of the willow and the reed at the expense of open water areas (MoEW et al. 2012). Also, low water level negatively affects the heronry, in particular the populations of the Glossy Ibis, Eurasian Spoonbill and terns (Kamburova 2012). Furthermore, the maintenance of a high water level helped the Dalmatian Pelican recover and expand its population compared to the period when the levels were low. Yet, according to Michev and Simeonov (2011), the unusually high water level violates the integrity of the breeding places for the Dalmatian Pelican in the property. The hydrological connection of Lake Srebarna with the Danube is not optimal due to improper design and lack of maintenance of the sluice gates at the connecting canal Dragaika (Kabourova 2012, IUCN Consultation 2013).

► Dams/ Water Management or Use

Low Threat
Outside site

Valuable habitats are lost due to the removal of riparian vegetation around the farms in the vicinity of the property and its buffer zone (MoEW et al. 2012, Biserkov 2012). According to EEA (2013) management of aquatic and bank vegetation for drainage purposes have medium negative influence in the area surrounding the property and its buffer zone.

► Dams/ Water Management or Use

Low Threat
Outside site

Groundwater plays an important role in the maintenance of the water level in the property (Nikolova et al. 2010). For the restoration of the water balance in the lake it is necessary to limit the groundwater consumption in the catchment of the lake (Vasilev et al. 2012).

► Invasive Non-Native/ Alien Species

Low Threat

Inside site
Outside site

Forest formation of the Grey Willow combined with hydrophyte formations are key factor for the degradation of the lake (closing off of water body, increasing of bottom substrate etc.; Zhelezov 2010, Kamburova 2012). The Silver berry outcompetes the local and typical species and causes fragmentation of the reed bed where Dalmatian Pelicans and other fish-feeding birds breed (MoEW et al. 2012, IUCN Consulation 2013). The ecological change in the property is also brought about by the forestation and afforestation of extensive areas in the vicinity of the property using alien tree species, such as Austrian Pine, Hybrid Poplar, Black Locust, Common Gloxinia, and Oleaster (IUCN Consultation 2013). According to EEA (2013) invasion by exotic species has medium negative influence on the property and its buffer zone.

► Solid Waste

Low Threat
Outside site

The illegal dumping of household waste form the village of Srebarna is a source of organic pollution of the property, and thus contributes to its eutrophication (RIS 2002, MoEW et al. 2012, IUCN Consultation 2013, Birds in Bulgaria 2013). It also introduces many alien plant species in the property and its buffer zone (Birds in Bulgaria 2013).

► Identity/ Social Cohesion/ Changes in local population and community

Low Threat
Inside site
Outside site

Illegal fishing is related to poverty among the local residents (CLGE 2001)

Potential Threats

High Threat

Extreme weather conditions due to climate change, such as storms and floods are likely to have localized but reversible negative impacts on these values and integrity of the property. On the other hand, the expected lowering of the

water level in the Danube would interrupt the regular seasonal flooding of the property and potentially trigger significant ecological change. In the long-term the accumulation of sediments is likely to result in accelerated eutrophication and significant negative effects on multiple values and the integrity of the property.

► Fire/ Fire Suppression

Low Threat
Outside site

Potential threat for the area is the burning of the floating reedbeds in spring or summer that may destroy the Pelican colony, or the mixed heron colony (RIS 2002, Michev and Simeonov 2011, MoEW et al. 2012, IUCN Consultation 2013, Birds in Bulgaria 2013). According to EEA (2013) human induced fires have medium negative influence in the surrounding areas of the property and its buffer zone.

► Dams/ Water Management or Use

Data Deficient
Outside site

Deepening the bottom of the Danube, planned by the Government with EU funds, will cause further disturbance of the water regime and deterioration of the wetland habitats (Birds in Bulgaria 2013). No details were available on the project.

► Invasive Non-Native/ Alien Species

Data Deficient
Outside site

The reconnection of the lake with the Danube in 1994 heightens the risks from the introduction of new alien species, such as: Silver Carp, Grass Carp, Round Gobby, Stone Moroko, and Chinese Sleeper (Pehlivanov and Pavlova 2012).

► Water Pollution

High Threat

Inside site
Outside site

In the long-term, the eutrophication will accelerate the process of natural succession of the lake ecosystem to swamp to mire to wet meadow (LT Konsult Ltd. 2012, Kamburova 2012).

► Air Pollution

Very Low Threat
Outside site

The property is situated in the sphere of influence of industrial zones of Silistra, Calarash and Ruse (Ivanceva et. al. 2006, Hiebaum et al. 2012). According to EEA (2013) industrial pollution has low negative influence on the property and its buffer zone.

► Erosion and Siltation/ Deposition

High Threat
Inside site

In the long-term, at the current pace of sediment trapping, the lake will get shallower which in turn will accelerate eutrophication, deteriorate ecological conditions of the lake and further accelerate its succession to swamp to mire to wet meadow is a sediment trap (MoEW et al. 2012, IUCN Consultation 2013, BSPB 2013)

► Droughts

Data Deficient
Inside site
Outside site

Climate change is expected to lead to lower water level in the Danube and thus low frequency of flooding of the property (Nikolova et al. 2010). This will cause radical lowering of the water level and intensification of the eutrophication (Hiebaum et al. 2012). Currently there are no models predicting the effects of climate change on the property.

► Storms/Flooding

Low Threat

Inside site

The high water level and extreme storms can detach some reed islets in which the Dalmatian Pelican colony nests (IUCN Consultation 2013). This has been (partly) resolved with the construction of artificial (wooden) platforms (Simeonov 2011).

► Storms/Flooding

Low Threat
Inside site

There are potential threats to the colonies of the Dalmatian Pelican and Eurasian Spoonbill due to event of extreme flooding triggered by climate change (Triplet et al. 2008, Michev and Simeonov 2011, Hiebaum et al. 2012). According to EEA (2013) flooding has medium and neutral influence on some 50% of the territory of the property and its buffer zone.

Protection and management

Assessing Protection and Management

► Staff training and development

Some Concern

Staff capacity and numbers are mostly adequate to manage the site, with the exception of the number of guards/rangers (IUCN Consultation 2013). Capacity building and training has been provided for the staff through projects and networking (Danubeparks 2013). No further information is available concerning the maintenance of equipment and facilities, and community relations skills of the staff. Training needs previously identified include: fundraising, use of GIS in decision-making; development of tourism; and participatory conservation management (WHC 2006). Additional data is needed for a reliable assessment of this topic.

► Sustainable use

Some Concern

Recreational fishing and tourism are the primary types of resource use that

do not jeopardize property values. Due to the illegal fishing, however, the cumulative use of fish resources is unsubstantial and affects food availability for fish-feeding birds. A fish stock assessment is needed to ensure adequate food for birds and estimate the quantity available for recreational fishermen (IUCN Consultation 2013).

► Relationships with local people

Some Concern

The existing legal framework provides opportunity for public participation in the preparation and adoption of the management plan (RBNA 2002). However, there are no formal mechanism and procedures providing for participation of local stakeholders in the management of the property (WHC 2001, RBNA 2002).

► Legal framework and enforcement

Highly Effective

Land of the property and its buffer zone is entirely state owned. As of April 2013, the territory of property and its buffer zone have been included, partly or entirely in several legal designation: (1) Managed Nature Reserve Srebarna (892.05 ha), designated in 1948 (ordinance No.11931), increased in area in 1993 (ordinance No.581), re-categorized in 1999 (ordinance No.367), management plan endorsed in 2011 (No.РД-958) and ; decreased in area in 2005 (ordinance No.РД-1135); (2) Protected Site Pelikanite (542.8 ha), buffer zone of Nature Reserve Srebarna established in 1983 (decree No ДВ-3), designated as a Protected Site in 2007 (ordinance No.527). The territory of property and its buffer zone have been recognized, partly or entirely under several international treaties: (1) Wetland of International Importance Srebarna – 1975 (under the Ramsar Convention; Ramsar Site proper – 600 ha; Ramsar Site buffer zone – 542.8 ha); (2) UNESCO Biosphere Reserve – 1977 (under the UNESCO MAB Programme); (3) World Heritage of Srebarna Nature Reserve – 1983 (under the World Heritage Convention; 219bis; property - 638 ha; buffer zone – 673 ha); (4) Special Protected Area Srebarna – 2007 (under the EC Birds Directive; ordinance - No.РД-564; Id BG0000241; 1448.2177 ha); (5) Special Area of Conservation Srebarna - 2008 (under the EC Habitats Directive; ordinance - No.РД-564; Id BG0000241; 1448.2177 ha).

► Integration into regional and national planning systems

Highly Effective

The property was formally Integrated into the Silistra Municipal Development Plan 2007-2013 (MCS 2008), Tourism Development Strategy for Silistra Municipality 2008-2013 (Municipality of Silistra 2013b), and Regional Development Plan of the North-East Planning Region 2007-2013 (BG-CoM 2005),

► Management system

Mostly Effective

The Regional Inspectorate of Environment and Water – Ruse (RIEW-Ruse) is the Management Authority of the property; the staff includes one site manager (office in Ruse) and 2 rangers. RIEW-Ruse is also responsible for the management of the territory of the property and its vicinity covered by other national and international designations. The Institute for Biodiversity and Ecosystem Research (formerly Central Laboratory of General Ecology - CLGE) of the Bulgarian Academy of Sciences is responsible for research and monitoring activities (IBER-BAS 2013). The existing management plan (2001-2010) has expired; a new management plan is currently being developed. The existing national legal framework provides opportunity for public participation in the preparation and adoption of the management plan. However, there are no specific mechanism and procedures providing for participation of local stakeholders in the management of the property. The inclusion of the territory of the property and its buffer zone in the NATURA 2000 ecological network is likely to contribute to an improved capacity for addressing threats outside the property both at national and transboundary context.

► Management effectiveness

Some Concern

Some important actions prescribed in the management plan have not been implemented: (1) removal of sediments (high priority project); (2) control of the Grey Willow; (3) restoration of the natural water regime; and others (Kambourova 2012, IUCN Consultation 2013). The reserve is staffed by only two guards active from 8:00-17:00 which is only partly effective in the control

of illegal activities in the property and its buffer zone (IUCN Consultation 2013).

▶ Implementation of Committee decisions and recommendations

Mostly Effective

The State Party has implemented most of the decisions and recommendations of the World Heritage Committee related to the property. However, no information is available on the progress concerning the WHC recommendation that State Party explores the ways and means to collaborate with other States Parties sharing resident and migratory bird species and populations to collectively consider the merits of a “serial-like” or composite transboundary “Danube Wetland World Heritage Site” (WHC 2001). Additional data is needed for a reliable assessment of this topic.

▶ Boundaries

Mostly Effective

The boundaries of the property and its buffer zone are mostly effective in relation to the management and protection of its values. The property is included in other legal protection regimes which cover areas beyond its buffer zone and which are managed in ways that enhance property protection. The management and protection of its values can be improved through cooperation and coordination of activities in other adjacent protected areas along the Danube in Bulgaria and Romania. Progress has been made in this area under the Danubeparks initiative (Danubeparks 2013).

▶ Sustainable finance

Some Concern

Costs have been estimated only for a few priority actions prescribed by the management plan (CLGE 2001). Financial resources from the Ministry of Environment and Water have not been available for the implementation of some priority actions envisaged in the management plan. The funding provided by international organizations has narrowed the financial gap in the implementation of the management plan (e.g. Simenonov 2011).

▶ Education and interpretation programs

Data Deficient

In 1983 the Municipality of Silistra opened the Natural History Museum of the Biosphere Reserve Srebarna (Municipality of Silistra 2013). In 2000 there were five staff in the Museum, including a biologist (UNEP-WCMC and IUCN 2013). In addition, the Institute for Biodiversity and Ecosystem Research (IBER-BAS) opened information and education centre in the building of Field Ecological Station (Laboratory, Education Centre and Field Station of IBER-BAS). The exhibition in the Education Centre has three aquariums, 2 terrariums and 23 posters, which present the history and biological diversity of the reserve. There are information materials, posters that present the history, biological diversity of the Reserve, past and current scientific research that implement in the region of Srebarna Biosphere Reserve and some aquariums. No information was available concerning the cooperation and complementarity of education and interpretation programs implemented by the Museum and information and education centre of the IBER-BAS, as well as the activities implemented by various national and international NGOs. Additional data is needed for the assessment of this topic.

► Tourism and interpretation

Mostly Effective

In 1983 the Municipality of Silistra opened the Natural History Museum of the Biosphere Reserve Srebarna. In the period 2004-2007, 22.324 people visited the Museum (MCS 2008, Municipality of Silistra 2013). In 2000 there were five staff members, including a biologist, in the Museum (UNEP-WCMC and IUCN 2013). The wetland is a hotspot for bird watching and recreation, mainly by foreign tourists . The Danube riverbank, part of which is within the buffer zone of the property is a popular destination for anglers.

► Monitoring

Highly Effective

The comprehensive monitoring program (1998-2007) in the Srebarna wetland involved measurement of a set of abiotic parameters and a wide range of biodiversity parameters (CLGE 2013). The monitoring is conducted with the support from the permanent Ecological Station at Srebarna Biosphere Reserve Sciences (established in 1961). In 2007 there were 3 permanent staff members working in the field station (CLGE 2007). The laboratory is equipped to monitor the following parameters: nutrients,

phytoplankton and zooplankton composition, water level and temperature, quantitative estimations of bird populations. In addition NGOs and volunteers regularly assist in this exemplary on-going monitoring program for the property and its buffer zone.

► Research

Highly Effective

The Institute for Biodiversity and Ecosystem Research of the Bulgarian Academy of Sciences conducts regular ecological research which is relevant for the conservation of property values (CLGE 2013). The research is conducted with the support from the permanent Ecological Station at Srebarna Biosphere Reserve (established in 1961). In 2007 there were 3 permanent staff members working in the field station (CLGE 2007). In addition NGOs and volunteers regularly assist in this exemplary on-going research program for the property and its buffer zone.

Overall assessment of protection and management

Mostly Effective

The legal and administrative arrangements for the protection of the values and integrity of the property and its buffer zone, as well as important adjacent areas in Bulgaria and Romania, are considered sufficiently effective. In this context, the boundaries of the property and its buffer zone are considered adequate. The current management system is adequate, but it may be insufficient to maintain the values and integrity of the property over the long-term. The principle challenges include law enforcement, involvement of local stakeholders in conservation management planning and implementation as well as timely planning and sustained conservation financing. The on-going research and monitoring activities represent an outstanding and exemplary model for sound scientifically-based management of a World Heritage property.

► Assessment of the effectiveness of protection and management in addressing threats outside the site

Mostly Effective

The active participation of the management authority in transboundary and international initiatives and projects has contributed to an improved

cooperation and coordination of activities with adjacent protected areas along the Danube River in Bulgaria and Romania. Furthermore, the inclusion of the territory of the property and its buffer zone in the NATURA 2000 ecological network is likely to contribute to an improved capacity for addressing threats outside the property both at national and transboundary context.

▶ **Best practice examples**

The on-going research and monitoring activities represent an outstanding and exemplary model for sound scientifically-based management of a World Heritage property.

State and trend of values

Assessing the current state and trend of values

World Heritage values

▶ **An important wetland on the Western Palaearctic bird migratory flyway**
Good
Trend:Data Deficient

Srebarna Nature Reserve remains an important wetland that provides nesting grounds and seasonal habitat to a large number of bird species. The conservation status of the majority of populations is good.

▶ **Dalmatian Pelican, Pelecanus crispus**
Good
Trend:Stable

According to the EEA (2013) the conservation status of this species in the property is good. Current size of the breeding colony (108 pairs in average for the period 2007-2011, according to Kambourova 2012; 80-128 for the period 2001-2005 and 30-80 for the period 2006-2010) is larger than pre-nomination level (100-1050 pairs, according to WHC 1983a; 67 pairs according to WHC 1983b; app. 60 pairs according to Michev and Kamburova

2012, Kamburova 2012); the trend is improving, although significant fluctuations occur (Kamburova 2012). The colony size at the end of 19th century and the first half of the 20th century was comparable or somewhat larger (100-150 pairs, Kamburova 2012).

► Pygmy Cormorant, Phalacrocorax pygmeus

Good
Trend:Improving

According to the EEA (2013) the conservation status of this species in the property is good. Recently, the size of the breeding colony (60-300 pairs for the period 2001-2003; 105 in 2004 and 100 in 2005, according to Kambourova 2012) has been significantly larger than at the time oof inscription (10-20 pairs in the second half of the 20th century, according to Kambourova; 20 pairs in 1983 according to WHC 1983a, WHC 1983b); the trend is improving (Kamburova 2012).

► Ferruginous Duck, Aythya nyroca

Good
Trend:Improving

According to the EEA (2013) the conservation status of this species in the property is good. Recently, the size of the breeding colony (35-60 pairs for the period 2001-2003; 47 in 2004; 40 in 2005 and 53 in 2006, according to Kambourova 2012) has been somewhat larger than at the time of inscription (40-50 pairs in the second half of the 20th century, according to Kambourova); the trend is improving.

► Eurasian Spoonbill, Platalea leucorodia

Good
Trend:Improving

According to the EEA (2013) the conservation status of this species in the property is good. Recently, the size of the breeding colony (20-24 pairs for the period 2001-2003; 15 in 2004; 10 in 2005 and 20-30 in 2006, according to Kambourova 2012) has been somewhat larger than pre-nomination level (10-15 pairs in the second half of the 20th century, according to Kambourova; 3-10 pairs according to WHC 1983a).

► Glossy Ibis, Plegadis falcinellus

Low Concern
Trend:Data Deficient

According to the EEA (2013) the conservation status of this species in the property is good. However, according to other sources the size of the breeding colony (10-28 pairs for the period 2001-2003; 13 in 2004; 30 in 2005 and 5-10 in 2006, according to Kambourova 2012) has decreased compared to the pre-nomination level (50-500 pairs in the second half of the 20th century; WHC 1983a, Kambourova 2012).

► Purple Heron, Ardea purpurea

Good
Trend:Improving

According to the EEA (2013) the conservation status of this species in the property is good. Recently, the size of the breeding colony (8-50 pairs for the period 2001-2003; 15 in 2004 and 3 in 2005, according to Kambourova 2012) has been larger than pre-nomination level (4-9 pairs in the second half of the 20th century; Kamburova 2012); the trend is improving (Kamburova 2012).

► Ruddy Shelduck, Tadorna ferruginea

Data Deficient
Trend:Data Deficient

According to the EEA (2013) there are 2/0-4 pairs breeding in the property and the conservation status of this species is good. No breeding pairs were recorded in the period 2001-2003 and only one pair bred irregularly during the pre-nomination period (Kamburova 2012). More recently, Zehtindjiev et al. (2011) has not included the property as a breeding site of the Ruddy Shelduck. There are no sufficient data on the current trend.

► Little Bittern, Ixobrychus minutus

Good
Trend:Data Deficient

According to the EEA (2013) the conservation status of this species in the property is good. Recently, the size of the breeding colony (20-25 pairs for the period 2001-2003; 30 in 2004 and 25 in 2005, according to Kambourova

2012) has been larger than at the pre-nomination level; at the end of the 19th century 2-3 pairs bred in the property (Kamburova 2012). There are no data on the current trend of the population.

► Squacco Heron, Ardeola ralloides

High Concern
Trend:Deteriorating

According to the EEA (2013) the conservation status of this species in the property is good. However, recently, the size of the breeding colony (30-200 pairs for the period 2001-2003; 67 in 2004 and 70 in 2005, according to Kambourova 2012) has decreased compared to the pre-nomination level (21-548 pairs in the second half of the 20th century); it was numerous at the end of 19th century (Kamburova 2012). Therefore, over the period of 100 years, the trend is deteriorating (Kamburova 2012). Current threats include eutrophication, sediment accumulation and water level management.

► Little Egret, Egretta garzetta

Good
Trend:Improving

According to the EEA (2013) the conservation status of this species in the property is good. Recently, the size of the breeding colony (60-200 pairs for the period 2001-2003; 78 in 2004 and 85 in 2005, according to Kambourova 2012) has been larger than at the pre-nomination level (8-127 pairs in the second half of the 20th century; Kamburova 2012).

► Great White Egret, Casmerodius albus

Low Concern
Trend:Deteriorating

According to the EEA (2013) the conservation status of this species in the property is good. The current size of the breeding colony (2-12 pairs for the period 2001-2003, 7 in 2004 and 4 in 2005) is comparable to the pre-nomination level (10-15 pairs, according to WHC 1983a; 3-5 pairs in the second half of the 20th century; Kamburova 2012). The colony size at the end of 19th century was larger – 28 breeding pairs (Kamburova 2012). Thus, over the period of 100 years, the trend is deteriorating (Kamburova 2012). Current threats include habitat deterioration due to invasion by invasive

species.

► Whiskered Tern, Chlidonias hybridus

Good
Trend:Improving

According to the EEA (2013) the conservation status of this species in the property is good. Recently, the size of the breeding colony (25 pairs for the period 2001-2003, min. 35 in 2004; 38 in 2005, and more than 50 in 2006, according to Kambourova 2012) has been larger than at the pre-nomination level (5-20 pairs in the second half of the 20th century; Kamburova 2012).

► Black Tern, Chlidonias niger

High Concern
Trend:Deteriorating

According to the EEA (2013) the conservation status of this species in the property is good. However, no breeding pairs were recorded in the period 2001-2003 and 1-25 pairs bred in the property during the pre-nomination period (Kamburova 2012). According to the EEA (2013) there are 5/0-9 pairs breeding in the property. This species was numerous at the end of 19th century (Kamburova 2012). Therefore, over the period of 100 years, the trend is deteriorating (Kamburova 2012). Current threats include eutrophication, sediment accumulation and water level management.

► White-tailed Eagle, Haliaeetus albicilla

Data Deficient
Trend:Data Deficient

According to the EEA (2013) the conservation status of this species in the property is good. However, no breeding pairs have been observed in the property recently. According to WHC (1983a) there was one breeding pair at the time of nomination of the property. Existing data are not conclusive on the presence of this species in the property (WHC 2009, Kambourova 2012, Ivanov 2007, EEA 2013).

► Corncrake, Crex crex

Data Deficient
Trend:Data Deficient

Existing data are not conclusive on the presence of this species in the property (WHC 2009, Kambourova 2012, Delov 2011, EEA 2013). There are no data on the current state of conservation or the trend of the population.

► Greylag Goose, Anser anser

Good
Trend:Data Deficient

According to the EEA (2013) the conservation status of this species in the property is good. The current size of the breeding colony (1-2 pairs for the period 2001-2003, 3 in 2004; 3 in 2005, and 4 in 2006, according to Kambourova 2012) is comparable to that of pre-nomination level (1-15 pairs in the second half of the 20th century; Kamburova 2012). There are no data on the current trend of the population.

► Red-breasted Goose, Branta ruficollis

Good
Trend:Data Deficient

According to the EEA (2013) the conservation status of this species in the property is good. The property hosts 4/0-60 wintering individuals (EEA 2013). There are no data on the current trend of the population.

► Fieldfare, Turdus pilaris

Data Deficient
Trend:Data Deficient

The property hosts some 7500 wintering individuals (EEA 2013). No information was available on the current state of conservation and the trend of the population.

Other important biodiversity values

► Other bird species

The Saker Falcon is a species of global conservation concern. It is classified by IUCN as globally threatened in the category Endangered (IUCN 2012). The population of this species in Bulgaria is classified in the category Critically Endangered (Domuschiev et al. 2011). There are 0-1 breeding pairs in the

property and its buffer zone (2-0 % of the national population; EEA 2013). The White Stork is classified in Bulgaria in the category Vulnerable (Petrov et al. 2011a). There are 2/1-3 breeding pairs in the property and its buffer zone (2-0 % of the national population), and 1000 individuals stage at the property during the migration season (EEA 2013). Black Stork is classified in the category Critically Endangered (Petrov et al. 2011b). There are 30 individuals in the property and its buffer zone during the migration season (between 2 and 0 % of the national population; EEA 2013). There are 15/10-20 breeding pairs of Lesser Grey Shrike in the property and its buffer zone (2-0 % of the national population; EEA 2013) and 1-2 breeding pairs of Wood Lark. Night Heron is classified in Bulgaria in the category Vulnerable (Michev et al. 2011b). There are 75/50-100 breeding pairs in the property and its buffer zone (15-2 % of the national population; EEA 2013). Eurasian Eagle Owl is a species of pan-European conservation importance. Globally, the Eurasian Eagle Owl is classified by IUCN in the category Least Concern; but the population is decreasing (IUCN 2012). In Bulgaria this species is classified in the category Endangered (Boev et al. 2011b). There is a pair which resides in the property and its buffer zone throughout the year (EEA 2013).

► Mammal species

The Eurasian Otter is a species of European conservation concern, classified in the category Near Threatened (Temple and Terry 2007). In Bulgaria this species is classified in the category Vulnerable (Spiridonov and Spassov 2011a). There are 6/7 resident individuals in the property and its buffer zone (EEA 2013). The Marbled polecat is a species of European conservation concern, classified in the category Vulnerable; the population trend is decreasing (Temple and Terry 2007). In Bulgaria the Marbled polecat is classified in the category Vulnerable (Spiridonov and Spassov 2011b). The property and its buffer zone host between 2-0 % of the national population (EEA 2013).

► Amphibians and reptiles

The Hermann's Tortoise and the Spur-thighed Tortoise are both species of European conservation concern, classified in the category Vulnerable (Cox and Temple 2011). In Bulgaria these species are classified in the category Endangered (Beschkov 2011a). Both species are resident species in the

property and its buffer zone (EEA 2013). The Danube Crested Newt is a species of European conservation concern, classified in the category Near Threatened; the population has a decreasing trend (Cox and Temple 2011). In Bulgaria this species is classified in the category Vulnerable (Beschkov 2011d). The Danube Crested Newt is a resident species in the property and its buffer zone (EEA 2013).

► Fish species

The Ukranian Stickleback is a species of European conservation concern, classified in the category Least Concerned. In Bulgaria this species is classified in the category Endangered (Stefanov and Trichkova 2011c). In Bulgaria the species has recently become extremely rare, showing a continuous decline of its range; the property hosts a significant share of the national population of the Ukranian Stickleback (Stefanov and Trichkova 2011c). The European Mudminnow is classified in Bulgaria in the category Critically Endangered (Stefanov and Trichkova 2011b). The European Mudminnow is a resident species and its population in the property and its buffer zone accounts for 15-2% of the national population (EEA 2013).

► Water-fan, Aldrovanda vesiculosa

The Water-fan is a species of European conservation concern (is classified in the category Data Deficient; Bliz et al. 2011). In Bulgaria this species is classified in the category Critically Endangered (Meshinev 2011).The property hosts the only population of the Water-fan in Bulgaria (EEA 2013, Meshinev 2011, Valchev et al. 2012).

Summary of the Values

► Assessment of the current state and trend of World Heritage values

Low Concern

Trend: Data Deficient

The majority of the bird populations of the property enjoy good conservation status, and some of them have superseded their size at the time of inscription. However, when assessed against the best-recorded historical

conservation state, the conservation status of the Squacco Heron (Ardeola ralloides) and Black Tern (Chlidonias niger) has also deteriorated. Furthermore, the conservation state of Ruddy Shelduck (Tadorna ferruginea), White-tailed Eagle (Haliaeetus albicilla), Corncrake (Crex crex), Lesser White-fronted Goose (Anser erythropus), and Fieldfare (Turdus pilaris) could not be assessed reliably due to lack of or contradictory information.

▶ **Assessment of the current state and trend of other important biodiversity values**

Low Concern

Trend: Data Deficient

Following the information concerning the NATURA 2000 site Srebarna (EEA 2013), the vast majority of the other important values of the property enjoy good conservation status. The Water-Fan (Aldrovanda vesiculosa) is a notable exemption from the overall good conservation state. This species has low reproductive potential and also low competition potential and can be replaced by widely distributed floating water plants in the property. Furthermore, there are some concerns for the conservation status of the following species: Saker Falcon (Falco cherrug), White Stork (Ciconia ciconia), Black Stork (Ciconia nigra), Romanian Hamster (Mesocricetus newtoni), European Mudminnow (Umbra krameri).

Additional information

Key conservation issues

▶ **Maintenance of a water regime that provides for greatest possible restoration of natural hydrological and ecological conditions of the property**

Local

The effective hydrological connection of the property with the Danube River is not secured due to defunct or improper sluice gates. The existing water regime is inadequate to regularly flush the sediments whereas the project for their active removal is being delayed; also there are issues of feasibility and

negative effects of such a project to some values of the property. The failure to address these issues in the long-term is likely to result in significant effects on the values and integrity of the property due to accelerated eutrophication and the associated ecological change.

▶ **Incomplete understanding of long-term effects of the existing water level regime on biodiversity and key ecological parameters of the property**

National

Continued and upgraded research and special studies on hydrology, ecology and biodiversity of the property accompanied by continuous monitoring of biodiversity and key ecological parameters of the property are needed to provide sound scientific base for decision-making concerning the long-term effects of the existing water level regime on biodiversity and key ecological parameters of the property.

▶ **Control of poaching in the property and its buffer zone**

National

The persistence of illegal activities in the property and its buffer zone is indicative of insufficient management effectiveness, in part due to understaffed ranger service, inadequate law enforcement and inadequate cooperation with the local stakeholders. The resulting threats may hamper recovery or further improvement of the conservation status of the values of the property.

▶ **Low participation of local stakeholders in the management the property**

National

Continued and structured involvement of the local stakeholders in the management of the property in conjunction with a community outreach and education program about the value and uniqueness of the property are likely to improve management effectiveness and benefits sharing.

▶ **Habitat deterioration due to expansion of invasive species in the property**

Local

The on-going presence and potential expansion of invasive species, the Grey Willow in particular, impedes the recovery or further improvement of the conservation status of the values of the property.

▶ **Inadequate food availability for fish-feeding birds in the property**
Local

The lack of adequate data on the fish stock and lack of a plan for recreational fisheries affect the availability of food for fish-feeding birds. As a result, the recovery or further improvement of the conservation status of some of the values of the property is impeded.

Benefits

Understanding Benefits

▶ **Does management of the site provide jobs (e.g. for managers or rangers)?**

The property provides 3 job positions, directly related to management, and additional 8 jobs related to research and monitoring (indirectly to management) and education, interpretation and tourism (indirectly related to management).

▶ **Outdoor recreation and tourism**

In the period 2004-2007, 22.324 people visited the Natural History Museum. The wetland is a hotspot for bird watching and recreation, mainly by foreign tourists. The property is also popular with recreational fishermen. Tourism is a source for additional household income (e.g. Pelican Lake Guesthouse, Srebarna Guesthouse, etc.).

▶ **Importance for research, Contribution to education**

In 1961 the biological station ‘Srebarna’ was established by the Institute of Zoology of the Bulgarian Academy of Sciences. In 1978 the station was transferred to Central Laboratory of General Ecology. It has conducted continuous monitoring of breeding colony of Dalmatian Pelican since 1955. In

1998 the ecological monitoring has being carried out by the former Institute of Ecology (later Central Laboratory of General Ecology, now Institute of Biodiversity & Ecosystem Research) in Srebarna. The on-going research and monitoring activities represent an outstanding and exemplary model for sound scientifically-based management of a World Heritage property. The research in the site has contributed to knowledge building on wetland ecology in general.

Summary of benefits

The site provides a number of benefits that are compatible with the long-term conservation of the values and the integrity of the property. Direct benefits for the local community include jobs and income from tourism and recreation activities. Nature conservation in the property is recognized and valued among conservationists and environmentalists in Bulgaria and internationally. The field station located at the property serves a base for research and monitoring of biodiversity and ecosystem processes in the reserve and adjacent wetlands and also for training of MSc and PhD students from Bulgaria and other countries.

Projects

Compilation of active conservation projects

№	Organization/ individuals	Project duration	Brief description of Active Projects
1	Regional Inspectorate for Environment and Waters – Ruse		Project Title: Activities for sustainable management of the Managed Reserve Srebarna and Reserve Beli Lom.
2	Dr. Varadinova, E., Team-leader Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences		Project Title: Monitoring of macrozoobenthos in lakes/reservoir as a part of the national monitoring program of surface water in Bulgaria for 2012. Start date: 2012 Date of completion: 2013

№	Organization/ individuals	Project duration	Brief description of Active Projects
3	Regional Inspectorate for Environment and Waters – Ruse WWF Bulgaria, Danube-Carpathian Programme, Bulgaria		Project Title: Control of the negative effects of invasive species and establishment of natural habitats through replanting of local species in the Managed Reserve Srebarna. Start date: 15.07.2009 Date of completion: 15.04.2013

Compilation of potential site needs

№	Site need title	Brief description of potential site needs	Support needed for following years
1	NA	Restoration of the stable bottom and natural depth through removal of sediments accumulated in the open-water area of the lake outside the breeding period. This was included in the now expired management plan (project 2.2.1 for the period 2001-2010). The future of this project may be determined during the development of the new management plan.	
2	NA	A fish stock assessment study to ensure fish populations are managed adequately as to availability of food for fish-feeding birds and subsequently develop a plan for recreational fisheries.	
3	NA	Development and implementation of a comprehensive community outreach and education program about the value and uniqueness of the property.	
4	NA	Identification of capacity building and training needs for the management authority staff and staff at the Natural History Museum of the Biosphere Reserve Srebarna and Education Centre and Field Station of IBER-BAS, and development an action plan to address the needs.	

REFERENCES

№	References
1	BG-CoM (Bulgarian Government, Council of Ministers) 2005. Regional Development Plan of the North-East Planning Region for the Period 2007-2013. Sofia: Bulgarian Government, Council of Ministers. http://www.strategy.bg/FileHandler.ashx?fileId=532. Accessed: 30 March 2013.
2	BSPB (The Bulgarian Society for the Protection of Birds) 2013. Srebarna. In: Areas Protection Activities. http://bspb.org/ovm.php?id=33&menu_id=65. Accessed: 15 March 2013.
3	Beschkov, V. 2011a. Hermann's Tortoise. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Teherman.html. Accessed: 15 March 2013.
4	Beschkov, V. 2011b. Spur-thighed tortoise. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Tegraeca.html. Accessed: 15 March 2013.
5	Beschkov, V. 2011c. Four-lined Snake. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Elquatuo.html. Accessed: 15 March 2013.
6	Beschkov, V. 2011d. Danube Crested Newt. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Trdobrog.html. Accessed: 15 March 2013.
7	Bilz, M., Kell, S. P., Maxted, N. and Lansdown, R. V. 2011. European Red List of Vascular Plants. Luxembourg: Publications Office of the European Union. Available online at: http://ec.europa.eu/environment/nature/conservation/species....
8	BirdLife International 2004. Birds in the European Union: a status assessment. Wageningen, The Netherlands: BirdLife International. Available online at: http://www.birdlife.org/action/science/species/birds_in_eur....
9	Birds in Bulgaria. Important Bird Areas. http://www.birdsinbulgaria.org/ovm.php?l=en&pageNum_Ovm_All.... Accessed: 15 March 2013.

№	References
10	Biserkov, V. 2012. Changes after 1948 in the habitats of mammals in the area. In: Y. Uzunov, B. B. Georgiev, E. Varadinoiva, N. Ivanova, L. Pehlivanov, and V. Vasilev (eds.) Ecosystems of the Biosphere Reserve Srebarna Lake, pp. 155-162. Sofia: Professor Marin Drinov Academic Publishing House. Available online at: http://www.wetlanet.org/documents/books/ecosystems-of-the-b….
11	Biserkov, V. and Naumov, B. 2012. Changes after 1948 in the habitats of amphibians and reptiles in the area of the Srebarna Lake Biosphere Reserve In: Y. Uzunov, B. B. Georgiev, E. Varadinoiva, N. Ivanova, L. Pehlivanov, and V. Vasilev (eds.) Ecosystems of the Biosphere Reserve Srebarna Lake, pp. 163-183. Sofia: Professor Marin Drinov Academic Publishing House. Available online at: http://ec.europa.eu/environment/nature/conservation/species….
12	Boev, Z. 2011a. Little Bittern. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Ixminutu.html. Accessed: 15 March 2013.
13	Boev, Z. 2011b. Crane. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Grgrus.html. Accessed: 15 March 2013.
14	Boev, Z., Hristov, Y. and Domuschiev, D. 2011b. Eurasian Eagle Owl. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Bububo.html. Accessed: 15 March 2013.
15	Boev, Z., Michev, T., and Kambourova, N. 2011a. Purple Heron. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Arpurpur.html. Accessed: 15 March 2013.
16	Boev, Z., and Michev, T. 2011. Spoonbill. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Plleucor.html. Accessed: 15 March 2013.
17	CLGE (Central Laboratory of General Ecology) 2001. Management plan for the Srebarna Managed Reserve. Sofia: Central Laboratory of General Ecology, Bulgarian Academy of Sciences.
18	CLGE (Central Laboratory of General Ecology) 2007. Presentation of annual report of CLGE for 2007. http://www.ecolab.bas.bg/main/reports/2007/Presentation_Rep…. Accessed: 30 March 2013.

№	References
19	CLGE (Central Laboratory of General Ecology) 2013. Details about the organization. http://www.ciemat.es/CIEMATportal/recursos/doc/Redes_Cienti…. Accessed: 30 March 2013.
20	Cheshmedziev, S. (compiler). 2012. National action plan for the protection of the Ferruginous Duck (Aythya nyroca) in Bulgaria for the period 2012-2022. Sofia: The Bulgarian Society for the Protection of Birds.
21	Christensen, V., and Rossler, M. 1998. Assessment mission to Srebarna Nature Reserve (Bulgaria) – September/October 1998. Paris: UNESCO – WHC.
22	Cox, N. A. and Temple, H. J. 2009. European Red List of Reptiles. Luxembourg: Office for Official Publications of the European Communities.
23	Crivelli, A. J. (compiler) 1996. Action plan for the Dalmatian Pelican (Pelecanus crispus) in Europe. http://ec.europa.eu/environment/nature/conservation/wildbir…. Accessed: 15 March 2013.
24	Danubeparks 2013. In: Danubeparks: The Danube River Network of Protected Areas. Step 2.0. http://www.danubeparks.org/?story=1. Accessed: 10 April 2013
25	Delov, V. 2011. Corncrake. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Crcrex.html.html. Accessed: 15 March 2013.
26	Dereliev, S., and Simeonov, P. 2011. Red-breasted Goose. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Brrufico.html. Accessed: 15 March 2013.
27	Domuschiev, D., Michev, T., Stoyanov, G., Vatev, I., Petrov, T., and Ruskov, K. 2011. Saker Falcon. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Facherru.html. Accessed: 15 March 2013.
28	EEA (European Environment Agency) 2013. In: Natura 2000. NATURA 2000 - Standard Data Form: Site BG0000241/Srebarna (Last update: end of 2011). http://natura2000.eea.europa.eu/Natura2000/SDFPublic.aspx?s…. Accessed: 14 March 2013.
29	Freyhof, J. and Brooks, E. 2011. European Red List of Freshwater Fishes. Luxembourg: Publications Office of the European Union. Available online at: http://ec.europa.eu/environment/nature/conservation/species….

№	References
30	Hiebaum, G., Tsavkova, V., Christova, R., and Vassilev, V. 2012. Hydrochemistry and water quality. In: Y. Uzunov, B. B. Georgiev, E. Varadinoiva, N. Ivanova, L. Pehlivanov, and V. Vasilev (eds.) Ecosystems of the Biosphere Reserve Srebarna Lake, pp. 197-212. Sofia: Professor Marin Drinov Academic Publishing House. Available online at: http://www.wetlanet.org/documents/books/ecosystems-of-the-b....
31	IBER-BAS (The Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Science) 2013. In: About IBER. http://www.iber.bas.bg/?q=en/node/2. Accessed: 15 March 2013.
32	IUCN (International Union for Conservation of Nature) 2012. IUCN Red List of Threatened Species. Version 2012.2. . Downloaded on 14 March 2013.
33	IUCN World Heritage Consultation Form. Consulted on March 6, 2013.
34	Ivancheva, J., Tzenkova, A., Koleva, E., and Krastev, L. 2006. Climate Conditions in the Biosphere Reserve “Srebarna” Region. Paper presented at the International Scientific Conference on Water, Climate and Environment BALWOIS), May 23-26, Ohrid, Republic of Macedonia.
35	Ivanov, B. 2007. Population development of the White-tailed Eagle Haliaeetus albicilla in Bulgaria in the period from 1977 to 2005. Acrocephalus 28 (132): 17−21.
36	Ivanov, B. 2011. Black Tern. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Chniger.html. Accessed: 15 March 2013.
37	Ivanov, B., Georgiev, D., Dimitrov, M., and Barov, B. 2011. White-tailed Eagle. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Haalbici.html. Accessed: 15 March 2013.
38	Ivanov, B., and Dereliev, S. 2011. Greylag Goose. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Ananser.html. Accessed: 15 March 2013.
39	Jones, T., Martin, K., Barov, B., and Nagy, S. (Compilers). 2008. International Single Species Action Plan for the Conservation of the Western Palearctic Population of the Lesser White-fronted Goose Anser erythropus. AEWA Technical Series No.36. Bonn: Germany.

№	References
40	Kalchev, R., Beshkova, M., and Pehlivanov, L. 2010. First records on effect of renewed flooding of three wetlands from Belene Island (Lower Danube, Bulgarian stretch). Paper presented at the 38th IAD Conference, June 2010, Dresden, Germany.
41	Kalchev, R., Vasilev, V., Tzavkova, V., and Beshkova, M. 2012. Water transparency, chlorophyll-a and plankton primary production in the course of Srebarna Lake recovery. In: Y. Uzunov, B. B. Georgiev, E. Varadinoiva, N. Ivanova, L. Pehlivanov, and V. Vasilev (eds.) Ecosystems of the Biosphere Reserve Srebarna Lake, pp. 57-68. Sofia: Professor Marin Drinov Academic Publishing House. Available online at: http://www.wetlanet.org/documents/books/ecosystems-of-the-b….
42	Kalkman, V. J., Boudot, J.-P., Bernard, R., Conze, K.-J., Knijf, G. De, Dyatlova, E., Ferreira, S., Jović, M., Ott, J., Riservato, E. and Sahlén, G.. 2010. European Red List of Dragonflies. Luxembourg: Publications Office of the European Union. Available online at: http://cmsdata.iucn.org/downloads/european_red_list_of_drag….
43	Kambourova, N. 2005. The recent status of breeding bird communities of Srebarna Biosphere Reserve (NE Bulgaria). Acrocephalus, 26 (125): 81-97.
44	Kamburova, N. 2012. Ornithofauna of the Biosphere Reserve Srebrana. In: Y. Uzunov, B. B. Georgiev, E. Varadinoiva, N. Ivanova, L. Pehlivanov, and V. Vasilev (eds.) Ecosystems of the Biosphere Reserve Srebarna Lake, pp. 129-154. Sofia: Professor Marin Drinov Academic Publishing House. Available online at: http://www.wetlanet.org/documents/books/ecosystems-of-the-b….
45	Kamburova, N., and Michev, T. 2003. Habitat distribution of breeding waterbirds of Srebarna Managed Reserve, NE Bulgaria. Journal of Balkan Ecology, 6 (2): 191-199.
46	Kraleva, E., Pavlova, M.m Mazo Bedia, E., Borisova, P., Pehlivanov, L. 2012. Water quality of springs alongside Srebarna lake: preliminary chemical analysis. Ecological Chemistry and Engineering, Vol. 19, (4): 639—647.
47	LT Konsult Ltd. 2012. Analysis of the possibilities for improvement of the water regime of Srebarna Maintained Reserve. http://www.danubeparks.org/files/873_RLNP_HydrologyStudy_Sr…. Accessed: 25 March 2013.
48	MCS (Municipal Council of Silistra) 2008. Municipal Development Plan 2007-2013: 2008 update. http://silistra.bg/file/Municipal%20plan%20for%20developmen…. Accessed: 30 March 2013.
49	Meshinev, T. 2011. Aldrovanda vesiculosa In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 1. Plants & Fungi. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol1/Aldvesic.html. Accessed: 15 March 2013.

№	References
50	Michev T., Georgiev B. B., Petrova A. V., and Stoyneva M. P. (Eds.) (1998) Biodiversity of the Srebarna Biosphere Reserve. Checklist and bibliography. Sofia: Context and Pensoft.
51	Michev, T. 2011a. Squacco Heron. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Arralloi.html. Accessed: 15 March 2013.
52	Michev, T. 2011b. Little Egret. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Eggarzet.html. Accessed: 15 March 2013.
53	Michev, T. 2011c. Great White Pelican. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Peonocro.html. Accessed: 15 March 2013.
54	Michev, T. 2011d. Great White Egret. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Egalba.html. Accessed: 15 March 2013.
55	Michev, T., Boev, Z., Delov, V., and Nikolov, H. 2011b. Night Heron. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Nynyctic.html. Accessed: 15 March 2013.
56	Michev, T., Kambourova, N. and Michev, B. 2011a. Glossy Ibis. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Plfalcin.html. Accessed: 15 March 2013.
57	Michev, T., and Kamburova, N. 2012. Action plan for the protection of the Dalmatian Pelican in Bulgaria (2013-2022). Sofia: Ministry of Environment and Water.
58	Michev, T., and Simeonov, P. 2011. Dalmatian Pelican. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Pecrispu.html. Accessed: 15 March 2013.
59	MoEW (Ministry of Environment and Waters), BSPB (The Bulgarian Society for the Protection of Birds), BBF (Bulgarian Biodiversity Foundation), and IBER (The Institute of Biodiversity and Ecosystem Research) 2012. National Plan for the Protection of the Most Important Wetlands in Bulgaria (2013-2022). Sofia.

№	References
60	Municipality of Silistra 2013a. Natural history museum of the Biosphere Reserve Srebarna. http://silistra.bg/files/17.09.2012-27ac1c54c3d6db499e8488c…. Accessed: 30 March 2013.
61	Municipality of Silistra 2013b. Tourism Development Strategy for Silistra Municipality 2008-2013. http://www.silistra.bg/readarticle.php?article_id=129. Accessed: 30 March 2013.
62	Nikolov, H., Marin, S., Kambourova, N., and Demerdjiev, D. 2011. Pygmy Cormorant. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Phpygmeu.html. Accessed: 15 March 2013.
63	Nikolova, M., Vatseva, R., and Nikolov, V. 2010. GIS assessment of global change impacts on the dynamics of the Srebarna lake ecosystem. Paper presented at the 3rd International Conference on Cartography and GIS, June 15-20, Nessebar, Bulgaria.
64	Pehlivanov, L., and Pavlova, M. 2012. Ichthyofauna and fish communities. In: Y. Uzunov, B. B. Georgiev, E. Varadinoiva, N. Ivanova, L. Pehlivanov, and V. Vasilev (eds.) Ecosystems of the Biosphere Reserve Srebarna Lake, pp. 115-128. Sofia: Professor Marin Drinov Academic Publishing House. Available online at: http://www.wetlanet.org/documents/books/ecosystems-of-the-b….
65	Petkov, N. 2011. Ferruginous Duck. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Aynyroca.html. Accessed: 15 March 2013.
66	Petrov, T., Gradimir, G., Kmetova, E., Hristov, Y., and Michev, T. 2011a. White Stork. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Ciciconi.html. Accessed: 15 March 2013.
67	Petrov, T., Nikolov, H., and Darakchiev, A. 2011b. Black Stork. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Cinigra.html. Accessed: 15 March 2013.
68	Popov, A. 2011a. Yellow-spotted white-faced darter. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Lepector.html. Accessed: 15 March 2013.
69	Popov, A. 2011b. Romanian Hamster. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Menewton.html. Accessed: 15 March 2013.

№	References
70	RBNA (Republic of Bulgaria National Assembly) 2002. Biological Diversity Act. State Gazette 77.
71	RIS (Regional Inspectorate Silistra) 2002. Information Sheet on Ramsar Wetlands. http://www.wetlands.org/reports/ris/3BG001en_RIS_2002.pdf. Accessed: 15 March 2013.
72	Robinson, J. A., and Hughes, B. (Compilers). 2006. International Single Species Action Plan for the Conservation of the Ferruginous Duck Aythya nyroca. CMS Technical Series No. 12 & AEWA Technical Series No. 7. Bonn, Germany.
73	Shurulinkov, P. 2012. National action plan for the protection of the Great Bittern (Botaurus stellaris) in Bulgaria (2012-2021). Sofia: The Bulgarian Society for the Protection of Birds.
74	Simeonov, P. 2011. Srebarna Dalmatian Pelican Colony: a successful example of international partnership for Nature Conservation. Regulus 8.
75	Simeonov, P., and Dereliev, S. 2011. Lesser White-fronted Goose. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Anerythr.html. Accessed: 15 March 2013.
76	Spiridonov, G., and Spassov, N. 2011a. Eurasian Otter. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Lulutra.html. Accessed: 15 March 2013.
77	Spiridonov, G., and Spassov, N. 2011b. Marbled polecat. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Voperegu.html. Accessed: 15 March 2013.
78	Stefanov, T, and Trichkova, T. 2011a. Weatherfish. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Mifossil.html. Accessed: 15 March 2013.
79	Stefanov, T, and Trichkova, T. 2011b. European Mud-minnow. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Umkramer.html. Accessed: 15 March 2013.

№	References
80	Stefanov, T, and Trichkova, T. 2011c. Southern Ninespine Stickleback. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Puplatyg.html. Accessed: 15 March 2013.
81	Temple, H. J., and Terry, A. (Compilers). 2007. The Status and Distribution of European Mammals. Luxembourg: Office for Official Publications of the European Communities. Available online at: http://ec.europa.eu/environment/nature/conservation/species....
82	Triplet, P., Overdijk, O., Smart, M., Nagy, S., Schneider-Jacoby, M., Karauz, E. S., Pigniczki, Cs., Baha El Din, S., Kralj, J., Sandor, A., and Navedo, J. G. (Compilers). 2008. International Single Species Action Plan for the Conservation of the Eurasian Spoonbill Platalea leucorodia. AEWA Technical Series No. 35. Bonn, Germany. Available online at: http://www.unep-aewa.org/publications/ssap/eurasian_spoonbi....
83	UNEP-WCMC (United Nations Environment Programme, World Conservation Monitoring Centre) and IUCN (International Union for Conservation of Nature) 2013. World Heritage Information Sheets. http://www.unep-wcmc.org/medialibrary/2013/04/09/b32c3378/W.... Accessed: 13 April 2013.
84	Valchev, V., Tsonev, R., Georgiev, V., Tsoneva, S. 2012. Aquatic macrophytes: species composition and syntaxonomy. In: Y. Uzunov, B. B. Georgiev, E. Varadinoiva, N. Ivanova, L. Pehlivanov, and V. Vasilev (eds.) Ecosystems of the Biosphere Reserve Srebarna Lake, pp. 69-76. Sofia: Professor Marin Drinov Academic Publishing House. Available online at: http://www.wetlanet.org/documents/books/ecosystems-of-the-b....
85	Vasilev, V. P., Kalchev, R. K., Diadovski, I. K., Kalcheva, H., Ivanova, I. B., and Fikova, R. P. 2012. Spatial and temporal morphometric changes. In: Y. Uzunov, B. B. Georgiev, E. Varadinoiva, N. Ivanova, L. Pehlivanov, and V. Vasilev (eds.) Ecosystems of the Biosphere Reserve Srebarna Lake, pp. 185-196. Sofia: Professor Marin Drinov Academic Publishing House. Available online at: http://www.wetlanet.org/documents/books/ecosystems-of-the-b....
86	Vasilev, V., Fikova, R., Benderev, A., Shishkov, T., Koutev, V., Tsenkova, A., Koleva, E., Ivancheva, J., Krustev, L., and Dyadovski, I. 2012a. Physiographic features. In: Y. Uzunov, B. B. Georgiev, E. Varadinoiva, N. Ivanova, L. Pehlivanov, and V. Vasilev (eds.) Ecosystems of the Biosphere Reserve Srebarna Lake, pp. 3-11. Sofia: Professor Marin Drinov Academic Publishing House. Available online at: http://www.wetlanet.org/documents/books/ecosystems-of-the-b....
87	Vasilev, V., and Ivanov, B. 2011. Whiskered Tern. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Chhybrid.html. Accessed: 15 March 2013.

№	References
88	WHC (World Heritage Centre) 1983b. Nomination Documentation (file name: 219.pdf). http://whc.unesco.org/uploads/nominations/219bis.pdf.
89	WHC (World Heritage Centre) 1991. In: State of Conservation: Srebarna Nature Reserve (1991). http://whc.unesco.org/en/soc/1662. Accessed: 15 March 2013.
90	WHC (World Heritage Centre) 1992. In: State of Conservation: Srebarna Nature Reserve (1992). http://whc.unesco.org/en/soc/1681. Accessed: 15 March 2013.
91	WHC (World Heritage Centre) 1993. In: State of Conservation: Srebarna Nature Reserve (1993). http://whc.unesco.org/en/soc/1742. Accessed: 15 March 2013.
92	WHC (World Heritage Centre) 1994. In: State of Conservation: Srebarna Nature Reserve (1994). http://whc.unesco.org/en/soc/1783. Accessed: 15 March 2013.
93	WHC (World Heritage Centre) 2001.Mission Report. Srebarna Nature Reserve World Heritage Site, Bulgaria. 1-4 October 2001 (WHC-01/CONF.208/INF.5). Paris: WHC. Available online at: http://whc.unesco.org/archive/2001/whc-01-conf208-inf5e.pdf.
94	WHC (World Heritage Centre) 2004. In: State of Conservation: Srebarna Nature Reserve (2004). http://whc.unesco.org/en/soc/1415. Accessed: 15 March 2013.
95	WHC (World Heritage Centre) 2006. State of Conservation of World Heritage Properties in Europe, Bulgaria: Srebarna Nature Reserve. Available online at: http://whc.unesco.org/archive/periodicreporting/EUR/cycle01….
96	WHC (World Heritage Centre) 2009. Item 8 of the Provisional Agenda: Establishment of the World Heritage List and of the List of World Heritage in Danger. 8E: Adoption of retrospective Statements of Significance and of Outstanding Universal Value (WHC-09/33.COM/8E). Paris: World Heritage Committee.
97	WHC (World Heritage Committee) 1983a. World Heritage Nomination: IUCN Technical Review (Srebarna Nature and Biosphere Reserve; No 219). http://whc.unesco.org/archive/advisory_body_evaluation/219b….
98	Zehtindjiev, P., Bogdanova, M., and Bedev, K. 2011. Ruddy Shelduck. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Plfalcin.html. Accessed: 15 March 2013.

№	References
99	Zehtindjiev, P., Bogdanova, M., and Bedev, K. 2011. Ruddy Shelduck. In: V. Golemanski (Editor-in-Chief). Red Data book of the Republic of Bulgaria. Volume 2. Animals. Sofia: IBER-BAS & MOEW (electronic edition). http://e-ecodb.bas.bg/rdb/en/vol2/Taferrug.html. Accessed: 15 March 2013.
100	Zhelezov, G. 2010. Evaluation of the ecosystem service in the forest formations of Biosphere Reserve “Srebarna”, Northeastern Bulgaria. In: J. C. Azevedo, M. Feliciano, J. Castro and M.A. Pinto (eds.) Forest Landscapes and Global Change-New Frontiers in Management, Conservation and Restoration. Proceedings of the IUFRO Landscape Ecology. Working Group International Conference, September 21-27, 2010, Bragança, Portugal. 107-112. Bragança, Portugal: Instituto Politécnico de Bragança.