Final Report on the Impacts of Wind Energy Development on Birds in the Region of Kaliakra, Bulgaria (Activity 3)

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Content

1. Introduction

Climate change and biodiversity loss, if not averted immediately, may inflict severe impacts on ecosystem processes, functions and services that are crucial for human welfare. Increasing renewable energy deployment and expanding the current protected area network represent key solutions to these challenges, but conflicts may arise over the use of limited land for renewable energies as opposed to biodiversity conservation (Pogson et al. 2013; Pouzols et al. 2014; Meller et al. 2015). Development of wind power, one major type of renewable energy, is strongly increasing in Europe and elsewhere (AWEA 2014; EWEA 2015; Wang et al. 2015). Impacts on biodiversity by wind power are strongly contingent on the location of the wind turbines. Consequently, conflicts between nature conservation, local communities and wind energy companies are frequent, in terms of biodiversity conservation, in particular with regard to the impact of wind energy on birds and bats (Loss et al. 2013; Wang et al. 2015). Different kinds of impacts can occur and some of them are difficult to assess, particularly for rare and for endangered species (Stewart et al. 2007; BirdLife International 2013). The lack of comprehensive empirical data and of evidence-based knowledge syntheses of biodiversity impacts and the effectiveness of mitigation measures might hamper the long-term development of the wind power industry by reaffirming negative stereotypes and public opposition (Masden et al. 2010; BirdLife International 2013; May et al. 2015; Wang et al. 2015).

The Ministry of Environment and Water commissioned the preparation of a “Full-scale independent impact assessment of the exploitation of wind parks in the region of Kaliakra, pursuant to Recommendation 200 (2018) of the Standing Committee of the Bern Convention”. Herewith, the final report (“Activity 3”) with the results from this analysis, containing an assessment, recommendations, and conclusion is delivered.

2. History of Kaliakra SPA

In this section the historical information about the process of determining the Important Bird Area (IBA) and Special Protection Area (SPA) “Kaliakra” is developed. This includes (i) the state of the territory and the process of establishing IBA, (ii) a list of SPAs in Bulgaria and the place of SAC Kaliakra on the list, and (iii) the process of identifying SPA Kaliakra.

2.1 Status of the territory and the process of establishing IBA

The Kaliakra wind farms are situated close to the Black Sea coast in northeastern Bulgaria. According to the databases of the official webpages of the European Union[1], the "quality" of IBA Kaliakra is describe as follows:

"Kaliakra IBA is the only site in Bulgaria, which keeps the remaining Eastern Dobrudzha steppe, as well as the biggest cliffs along the Bulgarian Black Sea Coast. It supports 310 bird species, 71 of which are listed in the Red Data Book for Bulgaria (1985). Of the birds occurring there 106 species are of European conservation concern (SPEC) (BirdLife International, 2004), 17 of them being listed in category SPEC 1 as globally threatened, 21 in SPEC 2 and 68 in SPEC 3 as species threatened in Europe. The area provides key habitats for 100 species, included in Annex 2 of the Biodiversity Act, which need special conservation measures, of which 95 are listed also in Annex I of the Birds Directive. The territory of Kaliakra holds the last big and comparatively well preserved steppe habitat in the Dobrudzha. It is inhabited by typical steppe species, which are quite numerous ?[sic] Stone Curlew *Burhinus oedicnemus*, Greater Short-toed Lark *Calandrella brachydactyla* and Calandra Lark *Miliaria calandra*, 4 Wheater species, Rose-colored Starling *Sturnus roseus*. Almost the whole national population of the Pied Wheatear *Oenanthe pleshanka* is concentrated in the region. The Stone Curlew, the Greater Short-toed Lark and the Calandra Lark are presented there with the biggest populations in the country. The coastal cliffs host the only Bulgarian colony of the European Shag *Phalacrocorax aristotelis*. The open biotope supports a number of birds of prey, like the Long-legged Buzzard *Buteo rufinus*, the Common Kestrel *Falco tinnunculus*, the Hobby *Falco subbuteo*, the Levant Sparrowhawk *Accipiter brevipes*, the Eagle Owl *Bubo bubo*, etc. In the marine area of Kaliakra are registered the biggest flocks of the Mediterranean Shearwater *Puffinus yelkouan* in the country. The region is of exceptional importance during migration and it is typical bottleneck site, as it is located on the Via Pontica ? [sic] the second biggest migration flyway in Europe. Every autumn considerable numbers of soaring birds (more than 29,000 storks, pelicans and cranes and more than 3,000 birds of prey, including globally threatened species like the Pallid Harrier *Circus macrourus*, the Saker Falcon *Falco cherrug* and the Imperial Eagle *Aquila heliacal*) pass over Kaliakra. Cape Kaliakra is the point where Bulgaria's land territory reaches farthest into the sea. Due to the specific geography of the coastline (direction east - west) and the predominant NW wind migratory birds stay in the area longer than usual migrants, trying to avoid sea and to go back again above the mainland, and soaring to get higher. More than 60% of the migratory birds fly through the area up to 150 m high. When the wind is very strong storks and raptors (mainly harriers) lend on the fields between Kavarna and Cape Kaliakra. Only 9% of the birds pass the area flying higher than 500 m. The whole

[1] https://www.eea.europa.eu/data-and-maps/data/natura-11

territory of Kaliakra SPA between Kavarna and Tyulenovo is used as stopover site for migratory storks. The Kaliakra IBA is used as stopover site for migratory storks. As they confront the sea on their way south, the numerous flocks of songbirds, Quail and the globally threatened Corncrake *Crex crex* stop there to roost and feed. They migrate mainly during the night. More than 50,000 are registered only in the light part of the days during the autumn migration. Significant numbers of waterbirds overwinter in the area of Kaliakra, mainly geese, which stay there between December and March. They overnight in the sea and every day they fly over Kaliakra in order to feed in the inland arable lands. Often they land to feed in the arable land in the limits of the proposed SPA. In smaller numbers but regularly the globally threatened Red-breasted goose also overwinter in the region. Forty rare, threatened and endemic plant species and sub-species have been established in the region. Eight of them are included in the European list of rare, threatened and endemic plants and 20 are listed in the Red Data Book for Bulgaria (1984), 15 of them being in the category *rare* and 10 *threatened with extinction*."

Further it is specified that "The site is located in north-eastern Bulgaria and bears the name of the cape within its limits. It covers the easternmost part of the Dobrudzha plateau, with altitude from 0 to 150 m. To the west it borders on the town of Kavarna, to the north ?[sic] on the villages of between Rakovski, Hadzhi Dimitar and Sveti Nikola. To the north-east it's limit follows the road Sveti Nikola - Kamen Bryag ? [sic] Tjulenovo up to cape Shabla, including the coast with its adjacent shallow marine area from cape Shabla to the port of Kavarna. The village of Bulgarevo and the tourist resort Russalka are also in its limits. The coast is fringed with vertical cliffs up to 100 m high, with characteristic caves and niches. The vegetation is characterized mainly by the prevailing steppe associations and sparse trees and shrubs. It develops on shallow soils and almost exposed limestone rock. The region between Bulgarevo, cape Kaliakra and the area of Eni Kulak holds the last and best preserved steppe habitats in Bulgaria. They are the result of the combination of specific relief, soils and climatic conditions and it is especially important to conserve them, as they support typical species of the steppe biome. Most of the plants belong to the xerothermal type of formations. The flora of Kaliakra resembles the Crimean flora."

According to the official webpages of the European Union, the initial proposal and description of the site was made by Dimitar Georgiev, Dr. Petar Iankov, Irina Kostadinova - Bulgarian Society for the Protection of Birds, Bulgaria. Data were revised by a team of Bulgarian Academy of Sciences: Dr. B. Ivanov, Dr. B. Nikolov, Dr. D. Nankinov, L. Profirov, P. Simeonov. Thirty-one (31) documents are specified in the database[2] (Table 1).

[2] https://www.eea.europa.eu/data-and-maps/data/natura-11

Table 1. Documents specified in the European Natura 2000 database[3] for SPA Kaliakra.

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BirdLife International. 2000. Threatened birds of the world. Barcelona and Cambridge, UK: Lynx Edicions and BirdLife International, 695pp.

[3] https://www.eea.europa.eu/data-and-maps/data/natura-11

Birdlife International. 2004. Birds in Europe: Population estimates, trends and conservation status. Cambridge, UK: Birdlife International (Birdlife Conservation Series No. 12).373pp.
BSPB. 2005. Observation of autumn migration of soaring birds in Bulgaria in 2004 in terms of identification of bottleneck IBAs to be included in the European Ecological Network NATURA 2000 BSPB, Sofia, 14pp.
BSPB/BirdLife International. 2005. World Bird Database Important Birds Areas. Bulgaria. Cambridge. (unpublished)
Grimmet, R. F. A., R. T. A. Jones. 1989. Important Bird Areas in Europe. Cambridge, U.K.: ICBP (ICBP Technical Publication No9)
Guidelines for evaluation of protected zones according, which include habitats for birds to art.7, par.3, under the art.6 par.1.3 and 1.4 of the Biodiversity Act. 2005. (In Bulgarian.)
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Waliczky, Z. 2000 “Important Bird Areas of European Union Importance: explanation of the EU Criteria applied in IBA 2000” In: European IBA Workshop. 29 March - 2 April 2000, Brussels, Belgium. Proceedings. BirdLife International, 12-16"

2.2 List of SPAs in Bulgaria and the place of SAC Kaliakra on the list

In Bulgaria 120 SPAs are currently existing according to the official webpages of the European Union[4] (Table 2), for the SCIs including Kompleks Kaliakra see Annex 1

Table 2. List of Bulgarian Special Protected Areas (SPAs) including BG0002051 Kaliakra according to the official webpages of the European Union[5]. SPAs are sorted by site code.

SITE CODE	SITE NAME	SITE TYPE	DATE COMPI-LATION	DATE UP-DATE	DATE SPA	SPA LEGAL REFERENCE	EXPLANATIONS	AREA (HA)	MARINE AREA (%)
BG0002051	**Kaliakra**	**A**	**01.10.2005**	**01.12.2018**	**01.12.2007**	**Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).**	**Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 559/21.08.2009 (promulgated SG 69/2009). Extended terrestrial part of the site by Council of Ministers Decision No. 678/07.11.2013 (promulgated SG 99/2013). Issued Order No.RD – 97/06.02.2014 (promulgated SG 15/2014) for extension of the site and introducing in the increased area of the site the prohibitions set by Order No. RD – 559/21.08.2009, amended by Order No. RD – 818/12.12.2017 (promulgated SG 100/2017).**	**16172**	**34,28**
BG0000113	Vitosha	C	01.10.2003	01.12.2018	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA and adopted as pSCI by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the SPA – Order No. RD – 763/28.10.2008 (promulgated SG 99/2008).	27102	0
BG0000152	Pomoriysko ezero	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 78/03.02.2009 (promulgated SG 14/2009).	922	13,4
BG0000156	Shablenski ezeren kompleks	A	01.10.2005	01.07.2015	01.12.2007	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 259/16.03.2010 (promulgated SG 28/2010).	3175	20,3
BG0000191	Varnensko-Beloslavsko ezero	A	01.10.2005	01.07.2015	01.12.2007	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 128/10.02.2012 (promulgated SG 22/2012).	4687	0
BG0000209	Pirin	C	01.01.2006	01.12.2018	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA and adopted as pSCI by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the SPA – Order No. RD – 572/08.09.2008 (promulgated SG 84/2008).	40382	0

[4] https://www.eea.europa.eu/data-and-maps/data/natura-11
[5] https://www.eea.europa.eu/data-and-maps/data/natura-11

BG0000237	Ostrov Pozharevo	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 838/17.11.2008 (promulgated SG 108/2008).	976	0
BG0000240	Studenets	C	01.08.2004	01.12.2018	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA and adopted as pSCI by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the SPA – Order No. RD – 800/04.11.2008 (promulgated SG 105/2008), amended by Order No. RD – 67/28.01.2013 (promulgated SG 10/2013).	27946	0
BG0000241	Srebarna	C	01.10.2003	01.12.2018	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA and adopted as pSCI by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the SPA – Order No. RD – 564/05.09.2008 (promulgated SG 84/2008).	1448	0
BG0000242	Zaliv Chengene skele	C	01.10.2006	01.12.2018	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA and adopted as pSCI by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the SPA – Order No. RD – 513/22.08.2008 (promulgated SG 78/2008).	190	52,2
BG0000270	Atanasovsko ezero	C	01.10.2006	01.12.2018	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA and adopted as pSCI by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the SPA – Order No. RD – 839/17.11.2008 (promulgated SG 108/2008).	7210	0
BG0000271	Mandra - Poda	C	01.10.2005	01.12.2018	01.12.2007	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	Site classified as SPA and adopted as pSCI by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the SPA – Order No. RD – 131/10.02.2012 (promulgated SG 23/2012).	6139	3,4
BG0000273	Burgasko ezero	C	01.10.2006	01.12.2018	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA and adopted as pSCI by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the SPA – Order No. RD – 769/28.10.2008 (promulgated SG 102/2008).	3067	0
BG0000332	Karlukovski karst	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 788/29.10.2008 (promulgated SG 105/2008).	14211	0
BG0000399	Bulgarka	C	01.03.2006	01.12.2018	01.05.2011	Site classified as SPA by Council of Ministers Decision No. 335/26.05.2011 (promulgated SG 41/2011)	Adopted as pSCI by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Site classified as SPA by Council of Ministers Decision No. 335/26.05.2011 (promulgated SG 41/2011). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the SPA – Order No. RD – 848/08.11.2013 (promulgated SG 104/2013).	24009	0
BG0000494	Tsentralen Balkan	C	01.12.2005	01.12.2018	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA and adopted as pSCI by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the SPA – Order No. RD – 559/05.09.2008 (promulgated SG 84/2008).	72021	0
BG0000495	Rila	C	01.03.2006	01.12.2018	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA and adopted as pSCI by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the SPA – Order No. RD – 764/28.10.2008 (promulgated SG 100/2008).	77927	0
BG0000496	Rilski manastir	C	01.03.2006	01.12.2018	01.05.2011	Site classified as SPA by Council of Ministers Decision No.335/26.05.2011 (promulgated SG 41/2011)	Adopted as pSCI by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Site classified as SPA by Council of Ministers Decision No. 335/26.05.2011 (promulgated SG 41/2011). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the SPA – Order No. RD – 886/25.11.2013 (promulgated SG 107/2013).	25300	0

BG0002001	Rayanovtsi	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 569/05.09.2008 (promulgated SG 84/2008).	13186	0
BG0002002	Zapaden Balkan	A	01.10.2005	01.07.2015	01.12.2007	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 119/09.02.2012 (promulgated SG 20/2012), amended by Order No. RD – 68/28.01.2013 (promulgated SG 10/2013).	146832	0
BG0002003	Kresna	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 748/24.10.2008 (promulgated SG 97/2008).	23496	0
BG0002004	Dolni Bogrov - Kazichene	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 573/08.09.2008 (promulgated SG 84/2008).	2251	0
BG0002005	Ponor	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 547/05.09.2008 (promulgated SG 83/2008).	31377	0
BG0002006	Ribarnitsi Orsoya	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 565/05.09.2008 (promulgated SG 84/2008).	475	0
BG0002007	Ostrov Ibisha	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 514/22.08.2008 (promulgated SG 78/2008).	399	0
BG0002008	Ostrov do Gorni Tsibar	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 552/05.09.2008 (promulgated SG 83/2008).	218	0
BG0002009	Zlatiyata	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 548/05.09.2008 (promulgated SG 83/2008), amended by Order No. RD – 69/28.01.2013 (promulgated SG 10/2013).	43499	0
BG0002010	Yazovir Pyasachnik	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 574/08.09.2008 (promulgated SG 85/2008).	3178	0
BG0002012	Krumovitsa	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 765/28.10.2008 (promulgated SG 101/2008).	11183	0
BG0002013	Studen kladenets	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 766/28.10.2008 (promulgated SG 101/2008).	15995	0

BG0002014	Madzharovo	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 787/29.10.2008 (promulgated SG 105/2008).	3550	0
BG0002015	Yazovir Konush	A	01.10.2005	01.12.2018	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 367/16.06.2008 (promulgated SG 56/2008).	38	0
BG0002016	Ribarnitsi Plovdiv	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 81/03.02.2009 (promulgated SG 14/2009).	146	0
BG0002017	Kompleks Belenski ostrovi	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 82/12.02.2008 (promulgated SG 26/2008).	7010	0
BG0002018	Ostrov Vardim	C	01.10.2005	01.12.2018	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007) overlapping with pSCI BG0000204 "Vardim" adopted by the same Council of Ministers Decision. Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the SPA – Order No. RD – 560/05.09.2008 (promulgated SG 84/2008). With Council of Ministers Decision № 335/26.05.2011 (promulgated SG 41/2011) changes in the boundaries of SCI BG0000204 "Vardim" were adopted, so that its boundaries completely coincide with those of SPA BG00002018 "Ostrov Vardim" and a C–type site was formed. After the change only the name and site code of the SPA are retained.	1168	0
BG0002019	Byala reka	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 575/08.09.2008 (promulgated SG 85/2008).	44627	0
BG0002020	Radinchevo	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 783/29.10.2008 (promulgated SG 104/2008).	5786	0
BG0002021	Sakar	A	01.10.2005	01.07.2015	01.12.2007	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 758/19.08.2010 (promulgated SG 72/2010), amended by Order No. RD – 70/28.01.2013 (promulgated SG 10/2013).	125722	0
BG0002022	Yazovir Rozov kladenets	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 832/17.11.2008 (promulgated SG 108/2008).	1265	0
BG0002023	Yazovir Ovcharitsa	A	01.10.2005	01.12.2018	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 549/05.09.2008 (promulgated SG 83/2008).	4306	0
BG0002024	Ribarnitsi Mechka	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 561/05.09.2008 (promulgated SG 84/2008).	2582	0

BG0002025	Lomovete	A	01.01.2007	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 562/05.09.2008 (promulgated SG 84/2008). Site extended by Council of Ministers Decision No. 335/26.05.2011 (promulgated SG 41/2011). Issued Order No. RD – 382/19.04.2013 (promulgated SG 50/2013) for extension of the site and introducing in the increased area of the site the prohibitions set by Order No. RD – 562/05.09.2008.	33451	0
BG0002026	Derventski vazvishenia	A	01.10.2005	01.07.2015	01.12.2007	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 284/16.03.2010 (promulgated SG 29/2010), amended by Order No. RD – 71/28.01.2013 (promulgated SG 10/2013).	34864	0
BG0002027	Yazovir Malko Sharkovo	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 840/17.11.2008 (promulgated SG 108/2008).	1328	0
BG0002028	Kompleks Straldzha	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 550/05.09.2008 (promulgated SG 83/2008).	2873	0
BG0002029	Kotlenska planina	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 910/11.12.2008 (promulgated SG 15/2009), amended by Order No. RD – 72/28.01.2013 (promulgated SG 10/2013).	99300	0
BG0002030	Kompleks Kalimok	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 831/17.11.2008 (promulgated SG 108/2008), amended by Order No. RD – 86/28.01.2013 (promulgated SG 10/2013).	9429	0
BG0002031	Stenata	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 566/05.09.2008 (promulgated SG 84/2008).	80	0
BG0002038	Provadiysko-Royaksko plato	A	01.10.2005	01.07.2015	01.12.2007	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 134/10.02.2012 (promulgated SG 26/2012), amended by Order No. RD – 73/28.01.2013 (promulgated SG 10/2013).	84032	0
BG0002039	Harsovska reka	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 767/28.10.2008 (promulgated SG 102/2008), amended by Order No. RD – 74/28.01.2013 (promulgated SG 10/2013).	35429	0
BG0002040	Strandzha	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 802/04.11.2008 (promulgated SG 106/2008), amended by Order No. RD – 75/28.01.2013 (promulgated SG 10/2013).	116389	0
BG0002041	Kompleks Ropotamo	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities	3858	17,2

							contradicting the conservation objectives of the site – Order No. RD – 82/03.02.2009 (promulgated SG 14/2009).		
BG00 02043	Emine	A	01.10. 2005	01.07. 2015	01.12. 2007	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 560/21.08.2009 (promulgated SG 69/2009), amended by Order No. RD – 76/28.01.2013 (promulgated SG 10/2013).	66751	26,4
BG00 02044	Kamchiyska planina	A	01.10. 2005	01.07. 2015	01.12. 2007	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 132/10.02.2012 (promulgated SG 23/2012), amended by Order No. RD – 77/28.01.2013 (promulgated SG 10/2013).	88897	3,1
BG00 02045	Kompleks Kamchia	A	01.10. 2005	01.07. 2015	01.12. 2007	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 354/03.05.2012 (promulgated SG 37/2012).	10301	7,7
BG00 02046	Yatata	A	01.10. 2005	01.07. 2015	01.03. 2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 81/12.02.2008 (promulgated SG 26/2008).	145	0
BG00 02048	Suha reka	A	01.10. 2005	01.07. 2015	01.03. 2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 853/15.11.2007 (promulgated SG 100/2007), amended by Order No. RD – 84/28.01.2013 (promulgated SG 10/2013).	25438	0
BG00 02050	Durankulashko ezero	A	01.10. 2005	01.07. 2015	01.12. 2007	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 258/16.03.2010 (promulgated SG 28/2010).	3356	28,9
BG00 02052	Yazovir Zhrebchevo	A	01.10. 2005	01.12. 2015	01.03. 2018	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 749/24.10.2008 (promulgated SG 97/2008).	2513	0
BG00 02053	Vrachanski Balkan	A	01.10. 2005	01.07. 2015	01.03. 2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 801/04.11.2008 (promulgated SG 105/2008).	30880	0
BG00 02054	Sredna gora	A	01.10. 2005	01.07. 2015	01.12. 2007	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 273/30.03.2012 (promulgated SG 32/2012).	99062	0
BG00 02057	Besaparski ridove	A	01.10. 2005	01.07. 2015	01.03. 2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 786/29.10.2008 (promulgated SG 106/2008), amended by Order No. RD – 78/28.01.2013 (promulgated SG 10/2013).	14765	0
BG00 02058	Sinite kamani - Grebenets	A	01.10. 2005	01.07. 2015	01.03. 2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 834/17.11.2008 (promulgated SG 108/2008).	15845	0

BG0002059	Kamenski bair	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 750/24.10.2008 (promulgated SG 97/2008).	1652	0
BG0002060	Galata	A	01.10.2005	01.07.2015	01.12.2007	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 127/10.02.2012 (promulgated SG 21/2012).	8044	25,6
BG0002061	Balchik	A	01.10.2005	01.07.2015	01.12.2007	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 130/10.02.2012 (promulgated SG 23/2012).	1560	0
BG0002062	Ludogorie	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 837/17.11.2008 (promulgated SG 11/2009), amended by Order No. RD – 79/28.01.2013 (promulgated SG 10/2013).	91389	0
BG0002063	Zapadni Rodopi	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 835/17.11.2008 (promulgated SG 108/2008). Site extended by Council of Ministers Decision No. 335/26.05.2011 (promulgated SG 41/2011). Issued Order No. RD – 890/26.11.2013 (promulgated SG 107/2013) for extension of the site and introducing in the increased area of the site the prohibitions set by Order No. RD – 835/17.11.2008.	133385	0
BG0002064	Garvansko blato	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 567/05.09.2008 (promulgated SG 84/2008).	324	0
BG0002065	Blato Malak Preslavets	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 568/05.09.2008 (promulgated SG 84/2008).	372	0
BG0002066	Zapadna Strandzha	A	01.10.2005	01.07.2015	01.12.2007	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 533/26.05.2010 (promulgated SG 52/2010), amended by Order No. RD – 83/28.01.2013 (promulgated SG 10/2013).	53821	0
BG0002067	Ostrov Golya	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 511/22.08.2008 (promulgated SG 78/2008).	415	0
BG0002069	Ribarnitsi Zvanichevo	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 803/04.11.2008 (promulgated SG 106/2008).	1571	0
BG0002070	Ribarnitsi Hadzhi Dimitrovo	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 785/29.10.2008 (promulgated SG 104/2008).	447	0
BG0002071	Most Arda	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities	15022	0

						No. 122/02.03.2007 (promulgated SG 21/2007).	contradicting the conservation objectives of the site – Order No. RD – 784/29.10.2008 (promulgated SG 104/2008).		
BG00 02072	Melnishki piramidi	A	01.10. 2005	01.07. 2015	01.12. 2007	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 283/16.03.2010 (promulgated SG 29/2010).	13580	0
BG00 02073	Dobrostan	A	01.10. 2005	01.07. 2015	01.12. 2007	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 528/26.05.2010 (promulgated SG 47/2010).	83655	0
BG00 02074	Nikopolsko plato	A	01.10. 2005	01.07. 2015	01.03. 2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 841/17.11.2008 (promulgated SG 108/2008), amended by Order No. RD – 80/28.01.2013 (promulgated SG 10/2013).	22246	0
BG00 02076	Mesta	A	01.10. 2005	01.07. 2015	01.12. 2007	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 532/26.05.2010 (promulgated SG 51/2010).	20427	0
BG00 02077	Bakarlaka	A	01.10. 2005	01.07. 2015	01.12. 2007	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 530/26.05.2010 (promulgated SG 49/2010), corrected by Order No. RD – 563/22.07.2014 (promulgated SG 67/2014).	33508	62,6
BG00 02078	Slavyanka	A	01.10. 2005	01.07. 2015	01.03. 2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 751/24.10.2008 (promulgated SG 97/2008).	19433	0
BG00 02079	Osogovo	A	01.10. 2005	01.07. 2015	01.03. 2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 780/29.10.2008 (promulgated SG 103/2008).	24125	0
BG00 02081	Maritsa - Parvomay	A	01.10. 2005	01.07. 2015	01.03. 2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 909/11.12.2008 (promulgated SG 13/2009).	11513	0
BG00 02082	Batova	A	01.10. 2005	01.12. 2018	01.12. 2007	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 129/10.02.2012 (promulgated SG 22/2012), amended by Order No. RD – 81/28.01.2013 (promulgated SG 10/2013) and by Order No. RD-389/07.07.2016 (promulgated SG 59/2016) .	38150	0,8
BG00 02083	Svishtovsko-Belenska nizina	A	01.10. 2005	01.07. 2015	01.03. 2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 768/28.10.2008 (promulgated SG 102/2008), amended by Order No. RD – 82/28.01.2013 (promulgated SG 10/2013).	5440	0
BG00 02084	Palakaria	A	01.10. 2005	01.07. 2015	01.12. 2007	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 133/10.02.2012 (promulgated SG 26/2012).	15799	0

BG0002085	Chairya	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 551/05.09.2008 (promulgated SG 83/2008).	1452	0
BG0002086	Orizishta Tsalapitsa	A	01.10.2005	01.12.2018	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 368/16.06.2008 (promulgated SG 56/2008).	3675	0
BG0002087	Maritsa - Plovdiv	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 836/17.11.2008 (promulgated SG 108/2008).	1109	0
BG0002088	Mikre	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 752/24.10.2008 (promulgated SG 97/2008).	12383	0
BG0002089	Noevtsi	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 808/06.11.2008 (promulgated SG 108/2008).	8475	0
BG0002090	Berkovitsa	A	01.10.2005	01.12.2018	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 842/17.11.2008 (promulgated SG 1/2009).	2800	0
BG0002091	Ostrov Lakat	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 512/22.08.2008 (promulgated SG 78/2008).	1261	0
BG0002092	Harmanliyska reka	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 843/17.11.2008 (promulgated SG 12/2009).	4889	0
BG0002093	Ovcharovo	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 844/17.11.2008 (promulgated SG 12/2009).	1478	0
BG0002094	Adata - Tundzha	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 556/05.09.2008 (promulgated SG 84/2008), amended by Order No. RD – 85/28.01.2013 (promulgated SG 10/2013).	5637	0
BG0002095	Gorni Dabnik - Telish	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 557/05.09.2008 (promulgated SG 84/2008).	3399	0
BG0002096	Obnova	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 555/05.09.2008 (promulgated SG 84/2008).	5422	0

BG0002097	Belite skali	A	01.10.2005	01.12.2018	01.12.2007	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 353/03.05.2012 (promulgated SG 37/2012), amended by Order No. RD – 816/12.12.2017 (promulgated SG 100/2017).	4163	41
BG0002098	Rupite	A	01.10.2005	01.07.2015	01.12.2007	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 282/16.03.2010 (promulgated SG 28/2010).	8835	0
BG0002099	Kocherinovo	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 770/28.10.2008 (promulgated SG 102/2008).	2435	0
BG0002100	Dolna Koznitsa	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 810/06.11.2008 (promulgated SG 108/2008).	3995	0
BG0002101	Meshtitsa	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 809/06.11.2008 (promulgated SG 108/2008).	3416	0
BG0002102	Devetashko plato	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 576/08.09.2008 (promulgated SG 85/2008), corrected by Order No. RD – 138/23.02.2009 (promulgated SG 21/2009).	7895	0
BG0002103	Zlato pole	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 771/28.10.2008 (promulgated SG 103/2008).	409	0
BG0002104	Tsibarsko blato	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 558/05.09.2008 (promulgated SG 84/2008).	910	0
BG0002105	Persenk	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 772/28.10.2008 (promulgated SG 103/2008).	16120	0
BG0002106	Yazovir Ivaylovgrad	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 845/17.11.2008 (promulgated SG 12/2009).	19662	0
BG0002107	Boboshevo	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 781/29.10.2008 (promulgated SG 104/2008).	4835	0
BG0002108	Skrino	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 782/29.10.2008 (promulgated SG 104/2008).	2495	0

BG0002109	Vasilyovska planina	A	01.10.2005	01.07.2015	01.12.2007	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 529/26.05.2010 (promulgated SG 48/2010).	45473	0
BG0002110	Apriltsi	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 563/05.09.2008 (promulgated SG 84/2008).	1935	0
BG0002111	Velchevo	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 773/28.10.2008 (promulgated SG 103/2008).	2312	0
BG0002112	Ruy	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 554/05.09.2008 (promulgated SG 83/2008).	17400	0
BG0002113	Trigrad - Mursalitsa	A	01.10.2005	01.07.2015	01.12.2007	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	Site classified as SPA by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 531/26.05.2010 (promulgated SG 50/2010).	55341	0
BG0002114	Ribarnitsi Chelopechene	A	01.10.2005	01.07.2015	01.03.2007	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	Site classified as SPA by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 553/05.09.2008 (promulgated SG 83/2008).	65	0
BG0002115	Bilo	A	01.09.2013	01.12.2018	01.11.2013	Site classified as SPA by Council of Ministers Decision No. 678/07.11.2013 (promulgated SG 99/2013)	Site classified as SPA by Council of Ministers Decision No. 678/07.11.2013 (promulgated SG 99/2013). Issued by the Minister of Environment and Water designation Order No. RD – 330/28.04.2014 (promulgated SG 41/2014) with prohibitions and restrictions on activities contradicting the conservation objectives of the site, amended by Order No. RD – 817/12.12.2017 (promulgated SG 100/2017).	8621	0
BG0002126	Pirin bufer	A	01.02.2011	01.07.2015	01.05.2011	Site classified as SPA by Council of Ministers Decision No.335/26.05.2011 (promulgated SG 41/2011)	Site classified as SPA by Council of Ministers Decision No. 335/26.05.2011 (promulgated SG 41/2011). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the SPA – Order No. RD – 352/11.04.2013 (promulgated SG 48/2013).	31802	0
BG0002128	Tsentralen Balkan bufer	A	01.02.2011	01.07.2015	01.05.2011	Site classified as SPA by Council of Ministers Decision No.335/26.05.2011 (promulgated SG 41/2011)	Site classified as SPA by Council of Ministers Decision No. 335/26.05.2011 (promulgated SG 41/2011). Issued designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the SPA – Order No. RD – 321/04.04.2013 (promulgated SG 46 and 47/2013).	72021	0
BG0002129	Rila bufer	A	01.03.2015		01.04.2019	Site classified as SPA by Council of Ministers Decision No.177/03.04.2019 (promulgated SG 29/2019)	Site classified as SPA by Council of Ministers Decision No.177/03.04.2019 (promulgated SG 29/2019)	38378	0

2.3. The process of identifying SPA Kaliakra.

The site was classified as SPA by the Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).

The designation order by the Minister of Environment and Water with prohibitions and restrictions on activities contradicting the conservation objectives of the site – Order No. RD – 559 was issues at 21.08.2009 (promulgated SG 69/2009).

The terrestrial part of the site was extended by Council of Ministers Decision No. 678/07.11.2013 (promulgated SG 99/2013): Issued Order No.RD – 97/06.02.2014 (promulgated SG 15/2014) for extension of the site and introducing in the increased area of the site the prohibitions set by Order No. RD – 559/21.08.2009, amended by Order No. RD – 818/12.12.2017 (promulgated SG 100/2017).

Subsequent to the submission of "Recommendation No. 130 (2007) of the Standing Committee on the windfarms planned near Balchik and Kaliakra, and other wind farm developments on the Via Pontica route (Bulgaria)", the chronology of the case was described by the Third Chamber of the Court in its judgement on Case C‑141/14, on January 14th, 2016 as follows:

"On 18th December 2007, in accordance with the Birds Directive, the Republic of Bulgaria established the Kaliakra SPA. Nevertheless, that protection area covered only two thirds of the territory of the Kaliakra IBA. The Republic of Bulgaria also set up the Belite Skali SPA to the west of the Kaliakra SPA and outside the Kaliakra IBA. Furthermore, that Member State proposed to the Commission that a site of Community interest be designated under the name 'Kompleks Kaliakra' including almost the entire area covered by the Kaliakra and Belite Skali SPAs.

Following complaints submitted by the Bulgarian Society for the Protection of Birds (Bulgarsko druzhestvo za zashtita na ptitsite) concerning the insufficient scope of the geographical area covered by the Kaliakra SPA and the adverse effects of several business projects on natural habitats and habitats of bird species, the Commission sent a letter of formal notice on 6th June 2008 to the Republic of Bulgaria requesting that it address the failure to fulfil its obligations under Article 4(1) and (2) of the Birds Directive in respect of six SPAs, including the Kaliakra SPA. Since the Commission was not satisfied with the various replies submitted by the Republic of Bulgaria, it sent a second letter of formal notice on 1st December 2008 requesting the Republic of Bulgaria to remedy its failure to fulfil its obligations under Article 4(4) of the Birds Directive and the combined provisions of Articles 2(1) and 4(2) and (3) of Directive 2011/92 and of Annex III thereto, in so far as that Member State had authorised the installation of several wind farms within the Kaliakra IBA. The Republic of Bulgaria replied to those letters of formal notice on 30th January 2009 and subsequently submitted additional information on several occasions.

On 30th September 2011, the Commission sent a supplementary third letter of formal notice to the Republic of Bulgaria which, first, was designed to consolidate the two previous letters of formal notice and, secondly, contained new requests concerning the territories of the Kaliakra IBA, the Belite Skali SPA and the Kompleks Kaliakra SCI. That letter raised two sets of issues: the insufficient geographical scope of the territory of the Kaliakra SPA and the effects of several projects on the Kaliakra SPA, the Belite Skali SPA, the Kompleks Kaliakra

SCI and the area which should have been classified as an SPA, according to the IBA inventory, but which had not been so classified.

On 30th January 2012, the Republic of Bulgaria informed the Commission that the projects listed by it had been, for the most part, approved before that Member State's accession to the European Union or before the inclusion of the areas concerned in the Natura 2000 network, with the result that EU law was not applicable to those sites.

By letter of 22nd June 2012, the Commission delivered a reasoned opinion in which it complained that the Republic of Bulgaria had failed to fulfil its obligations under Article 4(1), (2) and (4) of the Birds Directive, Article 6(2), (3) and (4) of the Habitats Directive and the combined provisions of Articles 2(1) and 4(2) and (3) of Directive 2011/92 and of Annex III thereto.

The Republic of Bulgaria replied to that reasoned opinion and, on the basis of additional information, informed the Commission that it had taken a series of measures designed to correct the shortcomings identified.

As it took the view that the situation remained unsatisfactory, the Commission brought the present action on 24th March 2014."

In its judgement on the case in 2016, the Third Chamber of the Court declared, that:

"by failing to include all the territories of the important bird areas in the special protection area covering the Kaliakra region, the Republic of Bulgaria has failed to classify as special protection areas the most suitable territories in number and size for the conservation, first, of the biological species listed in Annex I to Directive 2009/147/EC of the European Parliament and of the Council of 30th November 2009 on the conservation of wild birds and, secondly, of the migratory species not listed in that annex but regularly occurring in the geographical sea and land area where that directive applies, with the result that that Member State has failed to fulfil its obligations under Article 4(1) and (2) of that directive;

by approving the implementation of the projects 'AES Geo Energy', 'Disib' and 'Longman Investment' in the territory of the important bird area covering the Kaliakra region which was not classified as a special protection area, although it should have been, the Republic of Bulgaria has failed to fulfil its obligations under Article 4(4) of Directive 2009/147;

by approving the implementation of the projects 'Kaliakra Wind Power', 'EVN Enertrag Kavarna' and 'Vertikal — Petkov & Co', and of the 'Thracian Cliffs Golf & Spa Resort', in the territory of the special protection areas covering the regions of Kaliakra and Belite Skali respectively, the Republic of Bulgaria has failed to fulfil its obligations under Article 6(2) of Council Directive 92/43/EEC of 21st May 1992 on the conservation of natural habitats and of wild fauna and flora;

by failing, first, to assess properly the cumulative effect of the projects 'Windtech', 'Brestiom', 'Eco Energy' and 'Longman Investment' in the territory of the important bird area covering the Kaliakra region which was not classified as a special protection area, although it should have been, and, secondly, by none the less authorising the implementation of the 'Longman Investment' project, the Republic of Bulgaria has failed to fulfil its obligations under Article 4(2) and (3) of Directive 2011/92/EU of the European Parliament and of the Council of 13rd December 2011 on the assessment of the effects of certain public and private projects on the environment and point 1(b) of Annex III to that directive, and under Article 2(1) of that directive, respectively;

Dismisses the action as to the remainder(…)."

Subsequent to the judgement of the Court, during the On-the-Spot Appraisal (OSA) documented by Pritchard (T-PVS/Files(2018)25), which took place on May 15 – 16th 2018, the progress of Recommendation No 130 (2007) implementation was assessed and commented. The OSA mission report includes clear proposals on the way towards implementation of missing aspects.

According to the OSA mission report, the following of the Committees most important recommendations have been apparently implemented by Bulgarian authorities until May 2018:

1. The Kaliakra SPA was extended to the originally identified area.
2. Efforts to mitigate potential bird mortality (early warning system and joint protocol for turbine shutdown) appear to be effective, as monitoring data suggests low levels of collision mortality.
3. A Strategic Environmental Assessment (cf. Gove et al. 2013; Hayes et al. 2015) and a Habitats Directive Appropriate Assessment were completed for the National Renewable Energy Action Plan in 2012. According to the strategy, wind energy developments limited to areas of low risk for birds will meet the national wind energy generation target.
4. Some progress was made in improving impact assessment processes and corresponding guidance documents have been produced.
5. Windfarm developments in sensitive locations no longer receive direct state subsidies and are currently prohibited in Natura 2000 sites and some other sensitive locations due to implementation of relevant paragraphs into SPA Designation Orders.
6. All unimplemented wind energy development consents in the Kaliakra area have expired due to legislation changes.

Apart from that, a need for action was seen concerning the following aspects:

1. Initiating a comprehensive assessment of windfarm impacts.
2. Scientific clarification of wind energy impact types and population effects on geese.

3. Mitigation or compensation measures targeting other relevant impact types (in addition to collision mortality).
4. Restart the finalisation process of an Integrated Management Plan for the three Natura 2000 sites in the Kaliakra area.
5. Focus on the topics cumulative effects, international best practice guidance and peer review to improve impact assessment and mitigation.
6. Find back to a relationship of trust and a constructive dialogue among some stakeholders.

Based on the findings from the OSA, the Standing Committee submitted the revised Recommendation No 200 (2018) to the Bulgarian authorities.

3. Description of relevant terms of the assessment

The following terms (cf. BirdLife International 2013, CEE 2013, 2018, Masden & Cook 2016) will be used in the assessment and are explained in alphabetical order:

Barrier Effects

Barrier effects can be caused by wind turbines disrupting links between feeding/roosting/nesting areas, or diverting flights, including migratory flights, around a wind farm. They have the potential to have fitness costs for individuals (with potential knock-on effects on breeding productivity, mortality and population size) and affect how birds use the landscape, as demonstrated by radar studies. Barrier effects are only likely to be significant for very large projects, or clusters of projects, or in situations where they cause disruption to daily flights, e.g. for breeding birds with high energy demands that cannot be compensated for.

Baseline and Comparator

Baseline monitoring to inform EIA needs to use consistent and recognised methodologies, ideally using a Before After Control Impact (BACI) model or a Before After Gradient study. Baseline surveys onshore need to be undertaken for a minimum one year period. Desk-top studies of existing information can be useful to identify potential issues for further baseline study and analysis and to understand the level of scrutiny that the project will need to pass and so the level of information required. Desk-based study cannot, however, be an alternative to field studies specifically addressing the project and its potential impacts. Baseline studies need to include the full wind farm area and a suitable buffer, as well as any control/reference area.

Collision risk and collision mortality

Collision mortality equals the number of birds that experience severe or lethal injuries when hit by the blade or colliding with other parts of the wind turbine while passing the airspace occupied by wind

farms. Although collision events with birds are generally quite rare, there have been well-noted cases where inappropriately sited wind turbines, together with poor wind farm design, have led to significant collision mortality for sensitive species. Risk is dependent largely on location, topography and species present. Large soaring birds seem to be particularly vulnerable with research showing griffon vulture *Gyps fulvus*, golden eagle *Aquila chrysaetos* and red kite *Milvus milvus* to be at considerable risk. Weather conditions can affect collision likelihood, and the frequency of adverse conditions at sensitive times (e.g. during migration) may be influential. Wind farms in locations intersecting flight routes between feeding and breeding or roosting locations can also significantly increase risk. Empirical evidence of flight avoidance responses to wind turbines remains sparse. Avoidance of entire wind farm areas has been observed by some species offshore. Habituation (or attraction) to the presence of wind turbines, if and where it occurs, may increase collision risk over time, if bird use of areas within the wind farm footprint increases.

Collision risk modelling

Assessment of impact on populations should always be the end objective of EIA with regards to birds – and over which geographic scale this should apply may be directed by legislation concerning designated sites and protected species (for example, Natura 2000 sites in the EU). Collision risk modelling provides a quantitative method of assessing collision effects, although uncertainty within the modelling framework needs to be accounted for (Vasilakis et al. 2016). The Band model (Band et al. 2007) is frequently used, but further models have been developed and are available to use. These models vary in their suitability for different situations and circumstances, due to the specific case or development they were designed for. Therefore it is important that the most appropriate model or method is used or adapted for the question at hand, and in some situations this may not always be the most frequently used model (Masden and Cook 2015). This is particularly important as all wind energy stakeholders (developers, consultants, regulators, advisers and conservation organisations) must have confidence in the methods used. Collision risk models can be used based on data collected pre- or post-construction. However, continued lack of comprehensive empirical data on avoidance rates still hampers unbiased assessment. The probability of weather events that change these avoidance rates is a key variable that needs to be considered. The use of matrices and models to help assess and predict disturbance impacts is evolving. Population models (including Population Viability Analysis) can be useful tools in aiding this analysis, although they are heavily dependent on the amount of demographic data available. This is likely to be a growing area of development in the coming years.

Compensation

Provision of compensation should always be a last resort, where avoidance and mitigation cannot remove potential impacts. If it includes provision of new habitat this should be in place and working before the damage occurs, should be as close to the removed habitat as possible, and potentially be

of a greater extent than that removed to take into account uncertainties over its utility. Collision mortality 'compensation' may include provision of measures elsewhere to increase populations of a species in a compensatory manner. Compensation for projects that affect Natura 2000 sites in the EU will only be allowable in very limited circumstances, defined by Article 6 of the Habitats Directive.

Cumulative impacts

When undertaking assessments, 'significance' of impacts is a key consideration, with particular reference to population impacts at the appropriate spatial scale. Cumulative Impact Assessment (CIA) is an integral and important part of the EIA which is often overlooked or poorly implemented. As the industry develops further this will have a rising importance. Multiple small impacts to individual survival and productivity can have a profound impact on sensitive bird populations. CIA needs to include all relevant planned or existing projects that affect the bird populations in question and whose impacts have not been fully mitigated, in order to avoid problems of 'baseline creep' (where reductions in population levels due to previous projects are not taken into account and form the baseline population for subsequent EIAs, thereby ignoring cumulative impacts). Regulators need to be aware of and avoid the potential for 'salami slicing' whereby developers avoid EIA requirements by splitting large projects into smaller units to avoid screening thresholds.

Displacement

Displacement of birds can occur during construction, operation and decommissioning of wind turbines, either due to the presence of the structures themselves and/or associated infrastructure or human activity associated with wind farms. The extent of any effects is variable between species and species groups, as is the degree of habituation (if any occurs). However, some generalisations are possible for some species groups. Displacement has potential impacts on breeding productivity and survival. The level of impact will depend on availability of unaffected habitat in the area or region. Long-term studies are still needed to gain a clearer perspective about the extent, duration and significance of displacement effects on birds.

Disturbance

Disturbance of birds can occur during construction, operation and decommissioning of wind turbines, either due to the presence of the structures themselves and/or associated infrastructure or human activity associated with wind farms. The extent of any effects is variable between species and species groups, as is the degree of habituation (if any occurs). In DIRECTIVE 2009/147/EC on the conservation of wild birds the term particularly applies on disturbances "[§ 5d] (…) during the period of breeding and rearing, in so far as disturbance would be significant having regard to (…) [§ 2] maintain the population of the species (…) at a level which corresponds in particular to ecological, scientific and cultural requirements."

Habitat Loss

Habitat loss from the turbine footprints is likely to be small, but can add up when associated road and grid infrastructure are included. This may be significant, particularly for large developments densely sited on sensitive or rare habitats, or where multiple projects affect the same habitat.

Indirect Effects

Indirect effects on birds may arise through effects on habitats and/or prey species. Effects on prey abundance and availability may be direct, or mediated via changes in habitats. This may increase or decrease habitat and food availability for some bird species and accordingly reduce or increase the magnitude of a particular risk (e.g. displacement or collision risk). The challenge is to assess these indirect effects along with the direct impacts and the difficulty lies in translating an effect, or cumulative effects, into their ultimate impacts. Other indirect effects can relate to increased accessibility of an area due to the road network constructed in wind farms.

Post construction monitoring

Post construction monitoring at wind farms needs to be able to show any short, medium and long-term effects from the project, and address all the relevant impacts identified in the EIA. These studies also need to be designed to evaluate the effectiveness of any mitigation measures and validate predicted impacts presented in the EIA. Displacement monitoring needs to incorporate pre-, during and post-construction surveys using comparable methods and with adequate statistical 'power' to be able to detect change. Mortality monitoring methods, analysis and technology have developed considerably in the last ten years, including the use of trained dogs and improved correction modelling.

Mitigation

There are a variety of mitigation measures that can be employed to reduce potential impacts on birds. These include micro-siting of individual turbines and infrastructure to avoid areas used by sensitive species, orientation of rows of turbines in parallel to common flight lines, undergrounding of associated power lines, or modifying turbine type and operation (such as increasing cut-in speeds or using radar/observer early-warning shut-down systems). Careful use of lighting and acoustic deterrence can modify bird behaviour around the wind farm, whilst implementation of management protocols and plans can reduce human disturbance during construction and operation. Finally site management plans can be used to modify habitats in and around the wind farm to reduce risks to birds, whilst enhancing their overall conservation value (cf. Marques et al. 2014; May et al. 2015).

Scoping

A scoping processes should include all relevant stakeholders to ensure all relevant issues are taken into account in the assessment, and that the appropriate level of baseline information is gathered. This should also focus EIAs on the key issues that need information and assessment. Developers should

seek to follow the avoidance-mitigation-compensation-enhancement hierarchy and demonstrate this through the EIA.

4. Constructed wind turbines in the region of Kaliakra

In the region of Cape Kalikara, 230 wind turbines are installed; thereof 95 are located in the SPA Kaliakra (Figure 1). 52 wind turbines are operated by AES Geo Energy Ltd., of which 33 are located within the SPA, 3 are operated by Vertical - Petkov & Co Ltd., 10 are operated by Disim Ltd. and Windex Ltd., 35 by Kaliakra Wind Power Ltd., 6 by Longman Investment Ltd. and 8 by EVN ENERTRAG Kavarna Ltd. (Table 3).

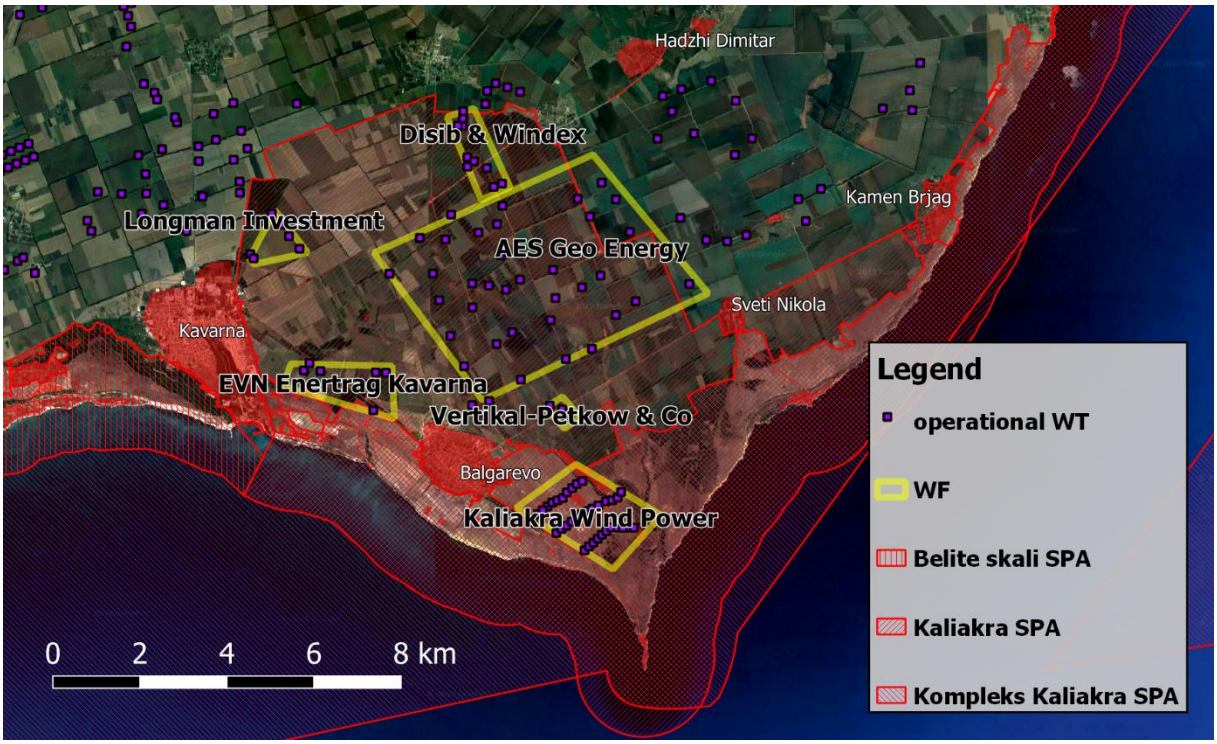

Figure 1. Overview of the Special Protection Areas in the Kavarna wind energy area. The area of wind farms objected to in the legal process are outlined in yellow.

Table 3. Wind turbines in operation in the SPA Kaliakra, their operators, location (village), impact assessment and operational life.

Operators	Number of WT	Villages concerned	Impact Assessment	Date of commissioning	Operational life
AES GEO ENERGY Ltd.	33	Bulgarevo, Sveti Nikola, Hadji Dimitar, Rakovski, P. Chunchevo	Decision on Environmental Impact Assessment No 1-2 / 114/2007	15.03.2010	25 years
VERTICAL - PETKOV & CO Ltd.	3	Balgarevo	Decision on Environmental Impact Assessment № 1-2/101/2005	02.03.2011 and 23.05.2011	20-30 years
DISIM Ltd. and WINDEX Ltd.	10	Rakovski, Hadji Dimitar, Kavarna	n.a.	13.06.2008, 18.06.2008, and 25.03.2009	Partly 35 years, partly unknown
KALIAKRA WIND POWER Ltd.	35	Balgarevo	Decision on Environmental Impact Assessment No 2-2 / 101/2005	20.06.2008	30 years
LONGMAN INVESTMENT Ltd.	6	Kavarna	n.a.	2005 & 2007	n.a.
EVN ENERTRAG KAVARNA Ltd.	8	Kavarna, Balgarevo	n.a.	n.a.	n.a.

5. The migration route “Via Pontica” in Bulgaria

The migration of soaring birds in Bulgaria can be greographically separated into three regions (Michev et al. 2012). They are from West to East, (i) the Via Aristotelis region that incorporates watersheds of the rivers Iskur, Struma and Mesta, reaches Serbia and FYR Macedonia to the West and the 24th Meridian to the East; (ii) the Via Balcanica region that incorporates the territory between the 24th meridian in the West and the line Ruse – Aytos/Karnobat – Malko Turnovo to the East; and (iii) the Via Pontica Region that incorporates the easternmost parts of Bulgaria, its western borders follow the line Ruse – Aytos/Karnobat – Malko Turnovo and the eastern one follows mainly the Black Sea.

The Via Pontica flyway is used more often by soaring migrants on a narrow front and is relatively well studied. Michev et al. (2012) conducted visual observations during autumn migration, on 1,640 days in August, September and October between 1979 and 2003. Their survey focusses on five species of waterbirds and 33 species of raptors. The mean annual number of migrating waterbirds during the survey was 169,072 individuals (maximum 250,623 in 1999), and the mean annual number of migrating raptors was 38,534 (maximum 65,065 in 1990). These data confirm that Via Pontica is major migration

route of soaring birds in Europe, and the most important for the autumn migration of several species, including White Pelican *Pelecanus onocrotalus* (mean across years: 20,946; maximum across years: 37,703), Dalmatian Pelican *P. crispus* (mean: 208; maximum: 498), White Stork *Ciconia ciconia* (mean: 145,177; maximum: 229,444), harriers *Circus* spp., Levant Sparrowhawk *Accipiter brevipes* (mean: 113; maximum: 457), Lesser Spotted Eagle *Clanga pomarina* (mean: 10,030; maximum: 25,786) and Redfooted Falcon *Falco vespertinus* (mean: 898; maximum: 3,077). Other raptor species with high numbers of migrating individuals include the Common Buzzard *Buteo buteo* (mean: 17,739; maximum: 31,746) and the Honey Buzzard *Pernis apivorus* (mean: 6,716; maximum: 23,759) (Michev et al. 2012).

Migration along Via Pontica is dynamic in the sense that depending on regional and local weather conditions, the main concentrations of migrating birds can shift locally among years, seasons of the year, and days (Kuijken 2007). There is evidence that the main core flyway is located West of the Kaliakra SPA. This pattern was detected by Michev et al. (2012) in their large scale assessment of migratory soaring birds in NE Bulgaria, by FANC (2002[6]) and the (Max Plank Institute of Ornithology data bank – MOVEBANK[7]) for White storks, by Iankov et al. (2019) for Lesser-spotted eagles and by Traxler et al. (2020) for soaring birds. However, also in Kaliakra SPA, aggragations of migratory birds occur, their size and frequency depend on whether conditions.

BSPB studied autumn migration close to Balgarevo village during 73 days in 2004 (BSPB 2005). 31,498 soaring birds were recorded, mainly white storks (26,309) and white pelicans (2,338). Also 2,549 raptors were detected, mostly common buzzards and honey buzzards. At this point migratory Black Kites, 151 were recorded, the biggest numebr for this species out of all observation sites along the Black Sea coast. Globally threatened species recorded included Imperial eagle and Pallid Harrier. 40% of the migratory birds fly through the area up to 150 m high. When the wind is very strong storks and raptors (mainly harriers) lend on the fields between Kavarna and Cape Kaliakra. BSPB (2005) further reported clearly higher numbers for the town Blachick, west of the study area, where 100,029 individuals were detected in similar composition across species as in Balgarevo.

For White storks it is further known that they rely much on wind characteristics, orographic updraft, and site-specific thermals, to facilitate their flight (Liechti et al. 1996). Their dependence on the weather and topography contributes to the vulnerability (Thelander et al. 2002) of the birds to collision with wind turbines, power cables, and other anthropogenic infrastructure that may be in their flight path (Kaługa et al. 2011). This is particularly true in cases where wind farms are located in the potential

[6] https://www.bfn.de/fileadmin/MDB/documents/BfN-Skripten066.pdf
[7]

flight corridors of the migratory birds. Indeed, the poor siting of wind farms dramatically increases the risk of collision with birds (Pierce-Higgins et al. 2009).

In the frame of the pre-construction and post-construction monitoring activities in the study area, White Stork data were obtained from 2004-2019. The number of encountered White Storks varied strongly across years, ranging from 87 to 22196 individuals (mean value: 2895 individuals).

These observations are matching with the pattern provided with the (Max Plank Institute of Ornithology data bank – MOVEBANK) dataset included GPS positions of more than 120,000 White Storks along their eastern European migration path. The flight pattern show that most individuals migrate West of the study area (Zehtindjiev 2020); however it must be stated that most of the storks were breeding birds from Germany and that individuals from eastern populations (e.g. from Ukraine or Eastern Belarus) might pass though the study area with a higher probability than the German storks.

In summary, only a minor fraction of the Via Pontica migratory storks and other birds are crossing the Cape, because there is not much reason to do so as they are avoiding sea crossings when possible. According to Zehtindjiev (2020), Autumn migration through Kaliakra SPA has been highly variable over the last 15 years but has not changed significantly from pre- to post-construction of wind farms. Kaliakra SPA is typically passed by several hundreds to less than 5,000 individuals per autumn migration season. Stronger aggregations of more than 10,000 individuals per season are rare events. Aggregations of more than 100 individuals at Kaliakra SPA are temporally limited to a few days per season.

6. Methods applied at wind farms in the Kaliakra region

According to Zehtindjiev (2020), vantage point observations were conducted at St Nikola wind farm (SNWF) and yielded a long-term dataset on migrating birds. The 156 MW wind farm consists of 52 turbines, parts of the wind farm (35 turbines) are located within the agricultural areas of terrestrial Kaliakra SPA, 3 km away from the southern and 5 km away from the eastern coastline (Figure 2).

In the first years of the study – i.e. 2008 (pre-construction), 2009 (construction) and 2010 – 2012 (operational) – vantage point observations were conducted from 15th of August to 30th of September, covering 47 days. For 2013, the study period was expanded to 31st of October and daily observations covered 78 days. Since 2014, observations started on the 1st of August and were conducted till 31st of October (92 days). Additional data from neighboring vantage points were collected during autumn migration 2018 and 2019.

Standard techniques were applied for the surveys (Bibby et al. 2000), based on vantage point observations by scanning the sky in all directions. In the year of 2009 (construction phase), the spatial survey protocol was changed during the study period, as vantage points were shifted north to test the early warning system for approaching flocks of birds. Some parameters (like flight altitude, direction) might be affected by this shift. According to Zehtindjiev (2020), height estimates and distances to the birds were verified with landmark constructions around the observation points previously measured and calibrated by GPS. Observers were equipped with 10x binoculars and all observation points were equipped with 20 – 60 x telescope, compass, GPS, and digital camera. Observations were conducted daily from 8:00 AM to 6:00 PM.

The focus of observation was layed on migratory birds and movements of flocks. The reported maximum observation distance for large aggregations of migrating flocks was 5,000m. Vantage points were distributed around the wind farm and hence not oriented along a cross-section of the migration front. Observations at vantage points arranged around a wind farm are more suitable to obtain data on airspace utilization and to prevent collisions by on-demand shut-down of turbines, whereas measuring realistic migration traffic rates is imprecise using this approach.

Nevertheless, observations at different vantage points were simply summed up to derive the seasonal migration numbers, which were later published in the annual reports. Retrospective analyses of the total counts to derive realistic migration traffic (due to double or multiple counts of roaming flocks, passing different vantage points) was not conducted, as even the uncorrected total number of observed flight movements did not reach a critical threshold.

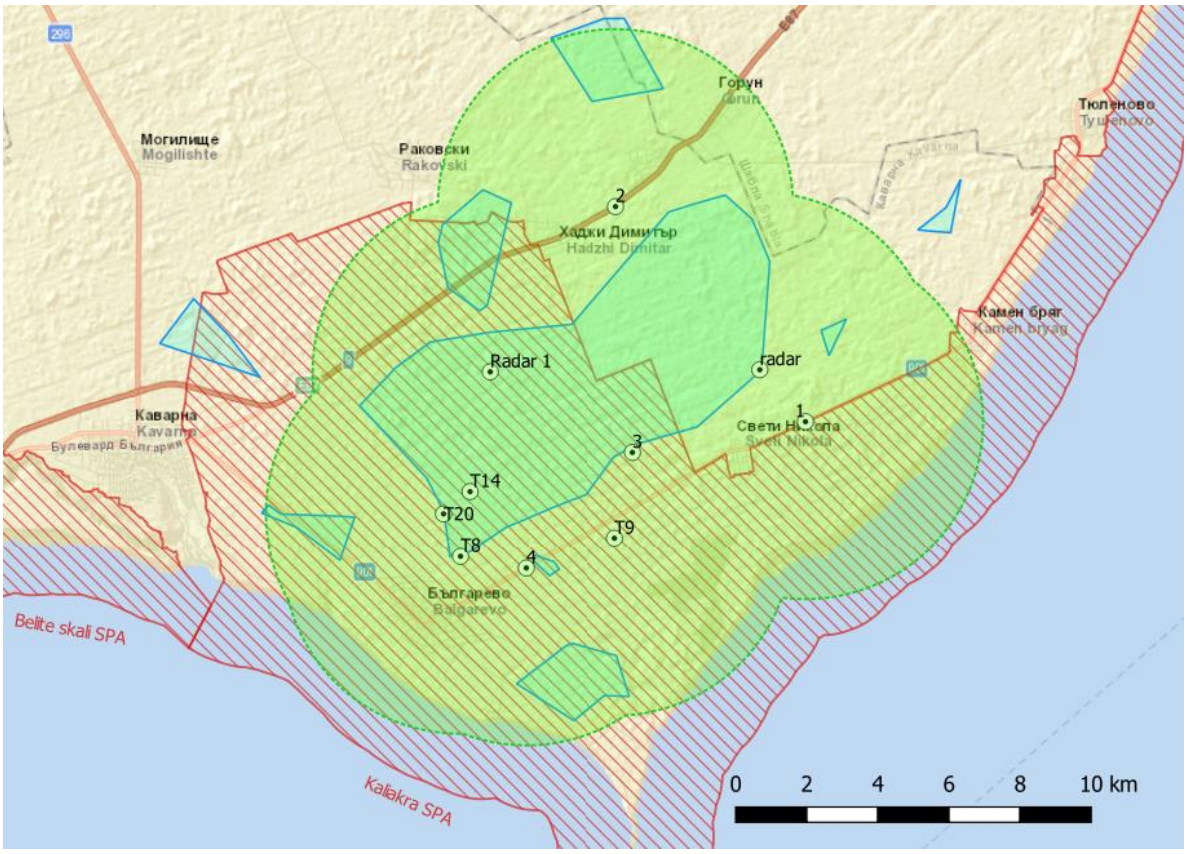

Figure 2. Vantage points and spatial coverage of SNWF observations in autumn 2010.

This approach was only adopted for White stork observations in autumn 2010 and 2014, when the specific meteorological preconditions caused mass aggregations of the species at Kaliakra SPA for several days. The birds rested between the wind farms and all observations were reported with main focus on collision avoidance. Following the collision avoidance protocol, flight movements of the same flocks were counted and documented multiple times. Estimation of migration traffic under these circumstances is scientifically challenging and requires simultaneous, very precise documentation of flight movements for retrospective analyses. Spatiotemporal correlation of flight movements during short periods of extraordinary presence of White storks to identify double counts was intensively discussed by the operating team of field ornithologists, shortly after the mentioned events. White stork counts from annual reports 2010 and 2014 resulted from these estimations of migrating individuals, while total counts are reported for all other focal species.

The presentation of results in the subsequent section, considers the migration of large flocks during periods of mass aggregation to derive a comprehensive picture of focal species migration.

In the first years of the study (2008 – 2012), vantage point observations were conducted from 15th of August to 30th of September, covering 47 days. In 2013, the study period was expanded to 31st of

October and daily observations covered 78 days. Since 2014, observations started on the 1st of August and were conducted till 31st of October (92 days).

Consequently, the following study periods can be considered for long-term analyses:

- 15th of August to 30th of September for 10 seasons or 470 days (2008 – 2017)
- 15th of August to 31st of October for 5 seasons or 390 days (2013 – 2017)
- 1st of August to 31st of October for 4 seasons 368 days (2014 – 2017)

During secondary analysis, correlation of focal species daily observation counts and a set of meteorological parameters (temperature, wind direction, air pressure trends, wind speed and wind gust speed at 80m altitude in daily resolution) obtained from the meteorological station IKAVAR1 at 43.44°N 28.34°E, 129m asl (data source: meteoblue.com).

Focus was layed on target species like storks *Ciconia ciconia & Ciconia nigra*, pelicans *Pelecanus onocrotalus & Pelecanus crispus*, Common cranes *Grus grus*, and raptor species *Aquila pomarina, Pernis apivorus, Falco vespertinus*. To obtain a more comprehensive picture, other frequently encountered non-target species Grey heron *Ardea cinerea*, Levant sparrowhawk *Accipiter brevipes* and Common buzzard *Buteo buteo* were included into the analyses, as well. The sample size for observations of other wind energy sensitive species is small, as their occurrence rate at Kaliakra SPA is low, in general. Therefore, these species are not suitable for secondary analysis of aggregation patterns.

7. Implemented Mitigation Measures

For wind farms sited in proximity to potentially vulnerable bird populations, appropriately implemented shutdown can significantly reduce collision mortality, see e.g. Ronconi et al. (2004), Smallwood et al. (2007, 2008), Cook et al. (2011), de Lucas et al. (2012) and Tomé et al. (2017). Early warning systems for shutdown on demand have been implemented to mitigate potential collision mortality at wind farms in the Kaliakra region.

7.1 The collision avoidance system at St Nikola Wind Farm, Kaliakra

After a testing phase a collision avoidance system was put into operation at St Nikola Wind Farm in Kaliakra in 2010. In a recent study, the general function of a turbine curtailment system to avoid direct impacts on birds by rotating blades is summarized and its application to St Nikola Wind Farm is described (Whitfield 2018), it works efficiently (see Chapter 11.1.2).

7.2 The Integrated System for Protection of Birds

At the Conference of Wind Energy Impacts on Wildlife 2019 in Stirling, Scotland, the Integrated Bird Protection System (IBPS), jointly implemented by wind farm operators and ornithological experts in 2018 to cover 114 operational wind turbines at Kavarna, was presented by Dr. Pavel Zethendjiev and discussed by an international audience. The IBPS focusses on the 95 wind turbines located within the Kaliakra SPA BG0002051 and covers 19 additional turbines in its close proximity. It is composed of ROBIN RADAR, BIRD SCAN MS1 and Deltatrak radar units combined with visual field observations and local meteorological data (Zehtindjiev 2020). Such set of components can effectively reduce collision risk, as shown at a wind farm site in Portugal (Tomé et al. 2017). Currently, human field observations are used as a reference during field trials of fully automated shut-down systems at developmental stage (KNE 2020). Due to the history of the specific case, apart from efficiency of implemented measures, comprehensibility and transparency have to be considered as highly important.

The system meets the requirements of internationally approved best practice, based on scientific methodology and state-of-the-art technical equipment. Detailed Information on the Systems function and successful implementation have been reported in the study "Turbine Shutdown Systems for Birds at Wind Farms: a Review and Application at the St. Nikola Wind Farm, Kaliakra, Bulgaria (Whitfield, 2018)". Information on the locally operating ISPB can be found in the migration monitoring studies conducted in 2017 and 2018 by Zehtindjiev listed in Table 6 and published online[8].

Field ornithologists are supported in real time by three different constantly operating radar units scanning, detecting and tracking approaching bird flocks and individuals within a range of appr. 10 km. The output data is used to cross-check visual observation reports.

The Early Warning System includes not only the shutdown protocol but also registers all types of potential impacts including collisions mortality, disturbance, displacement, barrier effects and habitat changes at all windfarm sites inside and adjacent to Kaliakra SPA from permanent vantage points (see Figure 3). Moreover, the simultaneous documentation of flock movements, position, flight direction and behavior is useful for spatiotemporal analysis of multiple counts to obtain solid data on local migration traffic and to improve our understanding of species local mass aggregation.

[8] https://kaliakrabirdmonitoring.eu/

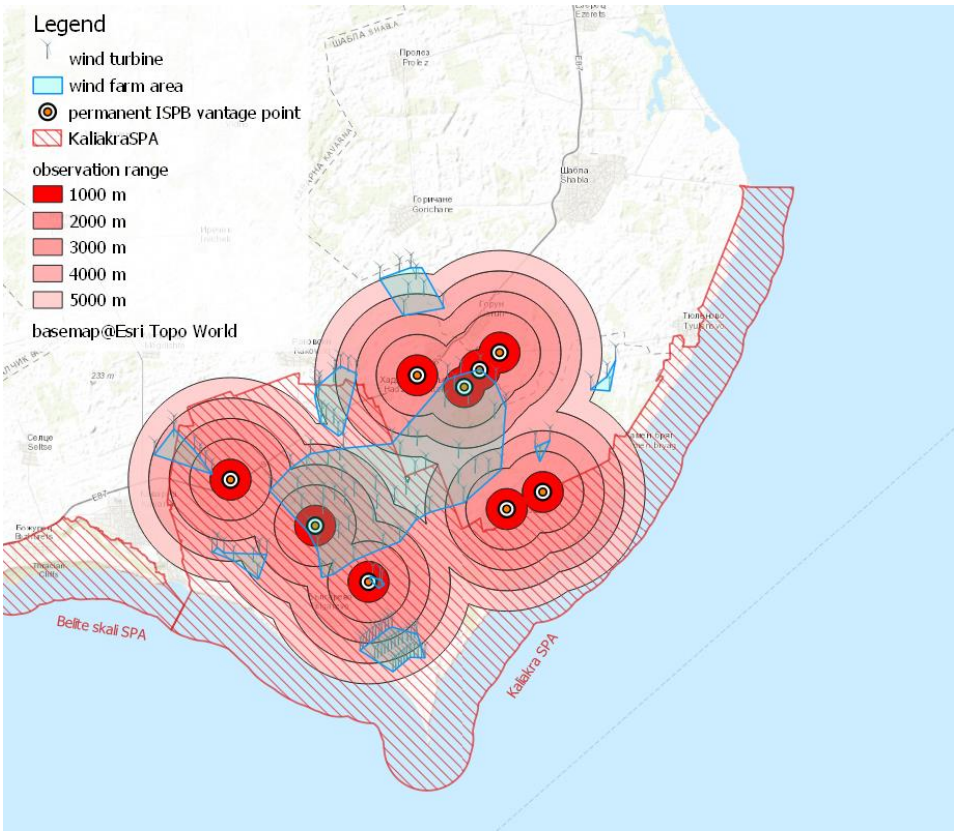

Figure 3. Overview on observation range of permanent ISPB vantage points for daily observations across the annual cycle (after Zehtinjiev 2020).

The IBPS documentation follows standard protocols, which include according to Zehtindjiev (2020):

- Visual observation protocol: maintained by field ornithologists, during daily observations. The information registered contains date, hour, species observed, number in the flock, observation point, coordinates, cloudiness of the sky, distance to the bird, attitude, flight direction, name of the observer, bird behaviour
- Shutdown protocol: registers the functioning of Turbine Shut Down System, date of stop and start, species observed, number of the birds, wind farm where the stop order has been issued, identification of the turbine or group of turbines, ordered by, wind direction
- Collision monitoring protocol: contains information for the date, turbine number, searcher name, finding (if any), English and Latin name, status, after Red data Book and IUCN, what is found and details for the condition of remains
- Daily field protocol: start/end time of searches under turbines, turbine identification code, terrain conditions, carcasses found.

The documentation is published online at https://kaliakrabirdmonitoring.eu/ in the following input formats (Zehtindjiev 2020):

- weekly bulletins: database, maintained by senior field ornithologist, containing data on (i) registered observed bird species by numbers; (ii) issued shut down orders by date: wind farm; turbine or group of turbines, species, number of birds stop time, re-start time; (iii) confirmed collision mortality of target species, and (iv) maps of the registered flocks and birds.
- monthly bulletins: prepared by the senior field ornithologist, containing the summarised information, registered on monthly basis.
- winter report: results and analyses of the winter bird survey
- spring report: covering spring migration season
- autumn report: covering autumn migration season
- Annual report: summarized monitoring activities, observations and conclusions

Additionally, a methodology report on IBPS is provided.

8 Relevant methods for impact assessment at operating wind farms

Assessments of the impact of wind farms on birds should deliver precise estimates of the impacts at population level for breeding species, wintering species and migrating species. According to Gove at al. (2013), the following factors are relevant, because they define the significance of impacts: species involved (reproduction strategy, lifespan, etc.); population size, distribution and status; magnitude of impact; probability of impact; type of impact; extent; duration; intensity; Timing; and probability. Of particular relevance are surveys that allow for precise estimates of collision rates and population status and trends.

8.1. Collision rates

Precise estimates of collision rates are depending on the intensity of sampling in space and time and the detection rate. The more turbines get samples and the shorter the temporal interval, the more precise estimates can be calculated. If the sampling regime differs across wind turbines (implying that not all turbines get sampled in the same intensity), care must be taken that sampled turbines are representative for all turbines and that extrapolation towards undersampled turbines does not introduce any bias. The temporal sampling regime is particularly important. Given the heterogeneous nature of collision events, care must be taken that relevant periods are well covered by sampling. Short interval, e.g. 5 days, allow for more precise estimates than longer ones (e.g. 30 days), as recently tested by Smallwood (2020). Intervals longer than 30 days yield very imprecise estimates. A further very relevant factor is a precise estimation of detection rates. Optimally, carcasses of birds of different sizes get places randomly (at random locations and random days) in the survey area in order to assess detection rates. Detection rates of birds are never 100% (Kery & Schmidt 2008), in the case of wind

farms, main factors for undetected carcasses are (i) heterogeneous vegetation and shrubs in combination with well camouflaged bird species such as instance larks, (ii) scavenging animals, and (iii) replacement of carcasses by humans (e.g. farmers, wind farm operators).

8.2. Population status and trends

Population status and trends are important factors to assess the impact of wind farms. Breeding and wintering bird populationsscan be affected by habitat loss, collision mortality and disturbance. Migrating birds are mainly threatened by collision mortality, however, also habitat loss and disturbance might affect them.

As bird populations show fluctuations due to natural factors or anthropogenic factors other than wind farms, it is relevant that assessments of population status and trends are undertaken in combination with parallel assessments in control sites. Thus, changes or trends in target areas can be compared to control sites in a reference area of similar habitat (BACI-design; Before-After Control-Impact; compüare e.g. Gopve et al. 2013): This allows for a precise assessment of the impact of e.g. a conservation measure such as a Natura 2000 area (Santana et al. 2014) or of the impact of any kind of infrastructure.

Similarly to collision rates, also population status and trends can be assessed precisely when spatial and temporal sampling is representative and intense. Schmidt et al. (2017) compared data from a fixed-beam radar with data collected by visual observations in the context of an extensive study on bird migration in the Austrian Alps. When estimating the intensity of migrating birds up to a height of 150 m above the ground, resulting migration traffic rates calculated from visual bird counts and radar measurements were strongly correlated. The minimum observation effort for visual birds counts delivering precise estimates were 19 observation days during a 5-week period of peak migration, thus approximately every second day. This intensive sampling regime is requires because of the strong day-to-day variation in the intensity of diurnal bird migration.

The constant progress in methodologies of wind farm site and impact assessment is controversially discussed. A downside of these intense controversies is, that implementation of state-of-the-art methodology into real-world projects substantially lags behind the scientific progress. In fact, study design components such as control-impact, before-after, or before-after-control-impact (BACI) designs are still rarely used when assessing at renewable energy facilities. A particularly important issue is that the appropriateness and effectiveness of methods for impact assessment differ strongly between pre-construction and post-construction monitoring. During the pre-construction monitoring, collision mortality modelling based on the space use of birds of the area before the construction of the turbines (following e.g. the Band et al. 2012 model) can be considered appropriate. However, such collision

estimates are usually very imprecise, mainly because birds are adapting their flight behavior to the turbines and because the rate of active avoidance can only be roughly guessed, but has a huge impact on the results. Vasilakis et al. (2016) for example applied avoidance rates from 95 % to 99.5% for Cinereous Vulture in the wind farms in northeastern Greece close to the Bulgarian border, resulting per definition is estimates that are differing in a factor of 10.

During post-construction monitoring, carcass searches in combination with search efficiency trials deliver much more precise results than any pre-construction assessments. For instance, Ferrer et al. (2012) analyzed data from 53 EIAs and compared them to post-construction collision monitoring results of 20 wind farms in the region of Tarifa, Southern Spain. The authors concluded that no clear relationship between predicted risk and the actual recorded bird mortality at wind farms was given. The assumed linear relationship between frequency of observed birds and fatalities, collision risk assessments were based on turned out to be not applicable. Parameters related to individual turbines and species-specific features seemed to be more relevant.

In a recent study, Conkling et al. (2020) analyzed EIA-reports from 231 wind farm projects in the US. Reports from only 29 % of facilities (n = 59) incorporated some element of experimental survey design. These included before-after (n = 42), control-impact (n = 8), or a BACI design (n = 8). Moreover, in only half of the reports that included pre- as well as post-construction data, the survey methods were similar across project periods. A relevant proportion of the reports analyzed was based on cited data and did not include primary surveys at all, while only 25 % of assessment reports from 163 wind facilities were based on data obtained from more than one project period (pre-construction, construction or post-construction).

Wind energy projects have been installed along each of the abovementioned European migration corridors. It appears, that even to date, integration of scientific standards (concerning data quality and representative sampling) into real-world impact assessment is internationally challenging. In the following chapter 9, representative examples are described concerning the biogeographic relevance of the site, potential impacts of wind energy, mitigation measures, and the corresponding process of risk assessment and monitoring.

9. Case examples from other EU member states

In this section wind power facilities from other European bird migration areas are presented. This includes (i) a description of the facilities and the impact monitoring, and (ii) comparison of built capacities to those in Kaliakra

Bird migration flyways of soaring birds and raptors are strongly determined by geographical features. These birds typically avoid open water passages as they utilize thermal updrafts over land during daytime for energy efficient migration. Consequently, the most important migratory bottlenecks located at the Mediterranean are (from west to east) the Straits of Gibraltar (Spain to Morocco), Sicily (Italy to Tunisia) and Bosporus (European to Asian Turkey) 200 km to the south of Kavarna. Another famous bottleneck site is found in the Baltic Sea, connecting Scandinavia and Northern Germany (Boere & Dodman 2010). The bottleneck sites, in relation to SPAs and regional wind farm densities are shown in Figure 4.

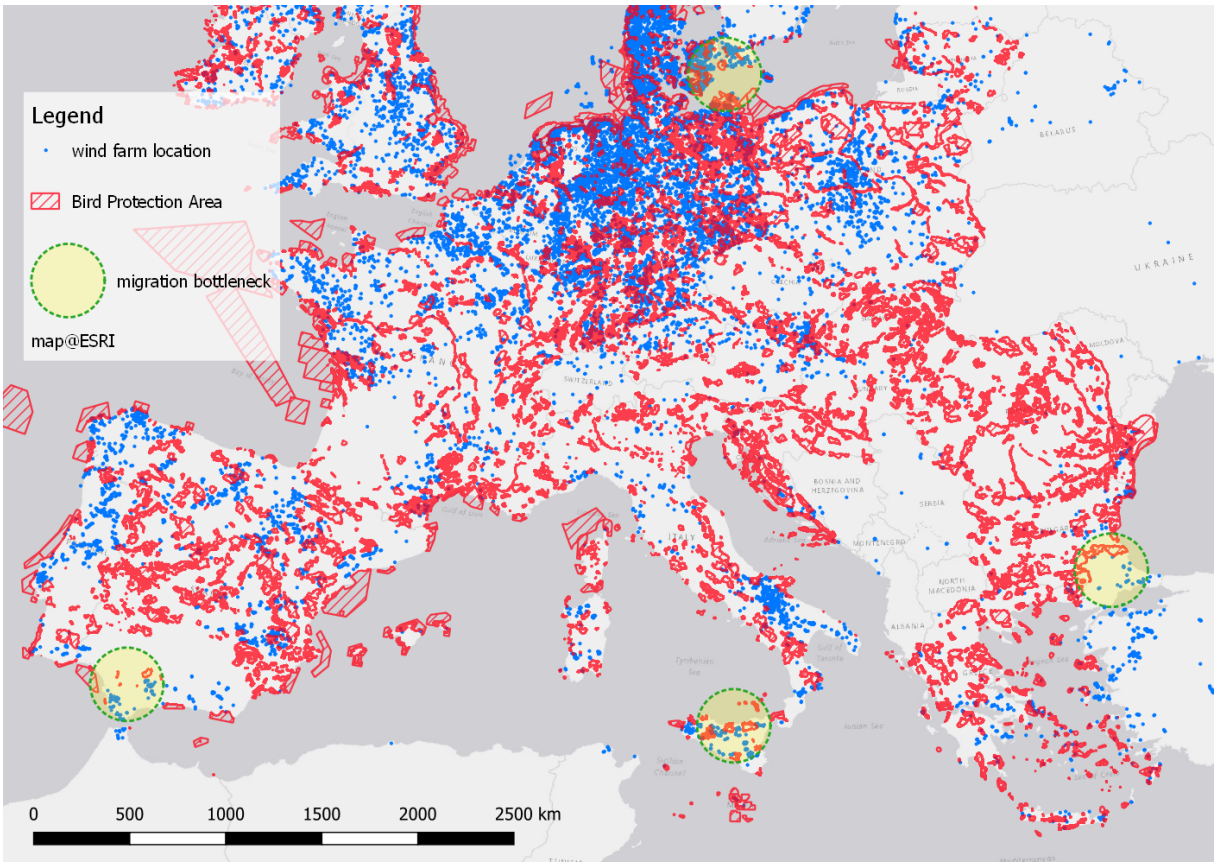

Figure 4. European Bird protection areas, most important migratory bottlenecks and location of wind farms in 2020. Wind farm data are provided by Dunnett et al. (2020).

9.1. Southern Iberia

The Strait of Gibraltar in Southern Spain represents the most important bottleneck site of Western European bird migration and its relevance is comparable to the Bosporus Strait in the East of the Mediterranean. Moreover, at large areas of the Spanish regions of Andalusia and Extremadura, as well as in neighboring Southern Portugal, relatively rough terrain, extensive land use and low disturbance levels produces well-suited habitats for soaring raptors (e.g. vultures).

Even though the Strait of Gibraltar is a distinct bottleneck of bird migration and is passed by the majority of western European biogeographic populations of migratory species, it is not listed among Natura2000 Bird Protection Areas (see Figure 5).

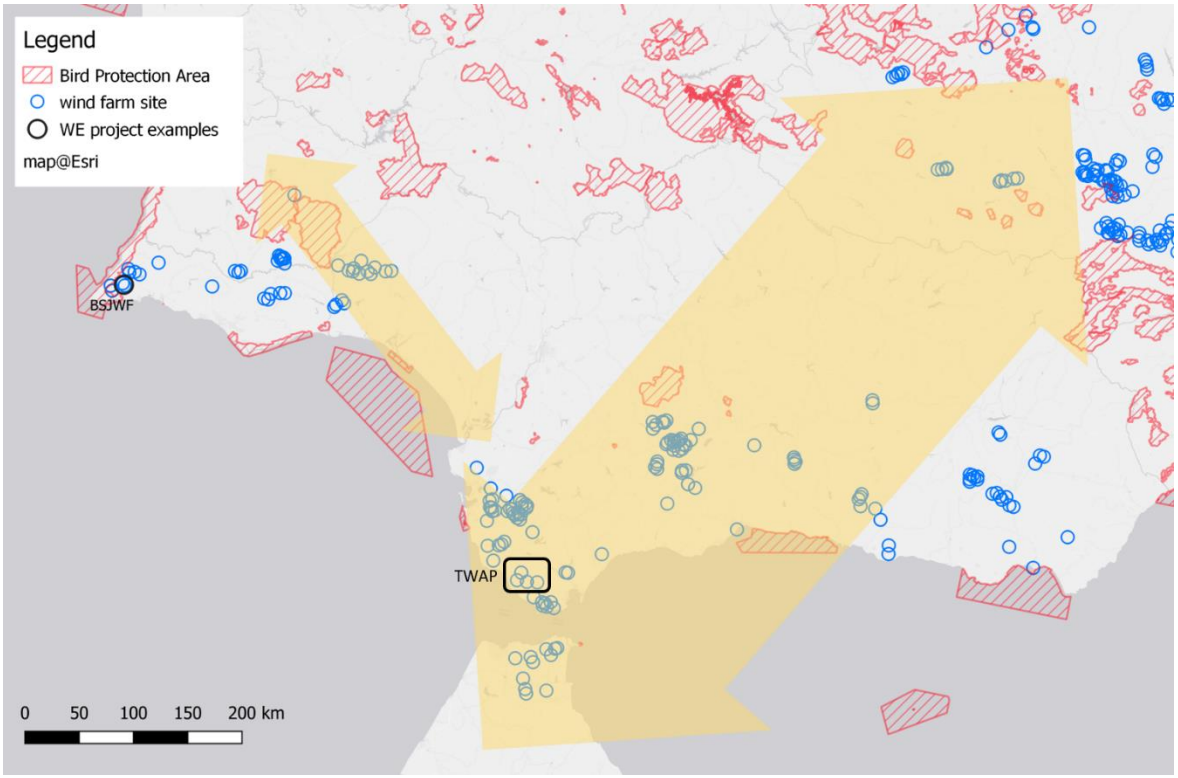

Figure 5. Spatial relation of SPAs, important migration routes of raptors and other soaring birds (yellow arrows) and wind energy development in proximity to the Strait of Gibraltar. BSJWF= Barão de São João WF (Portugal; 21 turbines), TWAP=Tarifa Wind Association Project (Spain; 269 turbines).

Wind energy development in this region started in the 1980s and soon raised concerns due to an associated increase of raptor mortality. The wind farms are located close to the migratory bottleneck of Gibraltar in Southern Spain, were some of the highest turbine collision mortality rates during migration of soaring birds have been recorded (Ferrer et al. 2012). Martín et al. (2018) investigated wind energy related mortality of soaring birds across the annual cycle at the Tarifa Wind Association Project (TWAP) consisting of 21 wind farms with 269 turbines. They started operating from 2005 to 2007. Around each turbine, a 50 m radius was searched daily for medium to large carcasses from August 2005 to July 2014. Small species were excluded from the searches. Due to the high searching effort, no carcass trials or correction factors were applied. The authors removed reported carcasses to avoid double counts due to the long average time span until complete disappearance.

During the 9-year study period, the authors reported 663 lethal collisions of raptors and 63 of White storks, resulting in an annual collision rate of 0.3 raptors and 0.026 White storks per turbine. Most of the collisions have been reported during migratory seasons but significant mortality rates were found

for the rest of the year, as well. Due to potential effects on raptor populations, mitigation measures to reduce collision risk have been undertaken.

De Lucas et al. (2012) investigated the efficiency of a turbine shut-down system (TSS), aimed at conservation of highly sensitive vulture species. The authors investigated a total of 296 turbines in the Tarifa region from 2006 to 2009 and applied the same methodology as reported by Martín et al. (2018). In 2006 and 2007, no mitigation measures were applied. In 2008 and 2009, 244 turbines were selectively shut down after identification of risk situations by field ornithologists. The authors found that on average vulture mortality could be reduced by 50 %. Moreover, the results provided further evidence, that individual siting of turbines within a wind farm is often a determinative factor for collision mortality.

At the southwestern end of the Iberian Penninsula, Barão de São João wind farm (BSJWF) is located close to Sagres, South Portugal (see Figure 5). It consists of 25 turbines (Repower MM92, 2 MW, 80 m tower) operating since 2008. From a total migration traffic of 5,000 individuals of 30 migratory soaring bird species, 55% pass the wind farm in the risk zone (20 – 200 m altitude) every autumn (Tomé et al. 2017). Mitigation of collision risk was implemented via Radar Assisted Shutdown on Demand (RASOD) protocol applied from 15th of August until 30th of November each autumn to reduce the probability of bird casualties.

Tomé et al. (2017) evaluated the effectiveness of the system in five autumn migration seasons from 2010 - 2014. The total seasonal observation counts of migrators and resident target species ranged from 8,995 to 26,543 individuals. It included species of conservation concern like the globally threatened Egyptian vulture *Neophron percnopterus*, Rueppell's vulture, *Gyps rueppellii* and Spanish imperial eagle *Aquila adalberti*, as well as species like the Cinereous vulture *Aegypius monachus*, the Red kite *Milvus milvus*, and the Pallid harrier *Circus macrourus,* categorized as "Near threatened" at the global level (IUCN 2015).

The abundance of wind energy sensitive bird species led to shut-down commands at 21 – 33 % of days across each season. Roughly one third of the shut-down command decisions was assisted by radar signals. During daily vantage point observations and carcass searches carried out every two weeks, not a single lethal collision has been reported. The four reported soaring bird fatalities (one griffon vulture *Gyps fulvus*, one common buzzard *Buteo buteo* and two Eurasian kestrels *Falco tinnunculus*) occurred during seasons, when RASOD was not operating. Loss of energy production due to turbine curtailment could be reduced from 1.2 % of operational time in the first years of implementation to 0.2% in 2014, as the RASOD operators gained experience and optimized the protocol.

9.2. Sicily

Due to massive illegal shooting of raptors in Southern Italy, NGOs started annual migration monitoring at the Strait of Messina, Sicily in 1984 (Dimarca & Iapichino 1984). Even though the Central European migration route may not be utilized by as many birds as the bottlenecks at Gibraltar or Bosporus, it is considered of specific importance during spring migration. It has been hypothesized, that many birds from Central Europe choose this more direct flight path in spring to earlier reach their breeding grounds (Agostini & Panuccio 2005). Annual spring migration counts from 1st of April until 26th or 27th of May during the seasons 1996 to 2000 reported by Corso (2001) revealed a migration traffic of inter alia 16,700 – 27,297 Honey buzzards *Pernis apivorus*, 1,621 – 3,074 Marsh harriers *Circus aeruginosus*, 546 – 1,008 Black kites *Milvus migrans*, and 151 – 1,012 Red-footed falcons *Falco vespertinus*. Observations were made from 7:00 am to 7:00 pm from vantage points located in the north facing slopes of the Peloritani mountain range (see Figure 6).

Sicily is not only relevant in terms of bird migration. Several SPAs are located on the island, for example the bird protection area ITA020048 Monti Sicani, Rocca Busambra e Bosco della Ficuzza, designated in early 2005. The Sicani Mountains are known to be one of the most diverse raptor hotspots in Italy and host a significant proportion of threatened species like Bonnelli's eagle *Aquila fasciata* or Lanner falcon *Falco biarmicus feldeggii* mainly found in the central South of Sicily (Sarà 2008, Di Vittorio et al. 2012, 2015). The degree of aggregated abundance in the central mountainous parts of the island differs among the species but reflect a general trend. According to Di Vittorio & López-López (2014), the Sicilian population of Golden eagle *Aquila chrysaetos* consisting of 16 -17 breeding pairs is on the brink of extinction, mainly due to drastic changes of habitats and reduced abundance of prey over the last two decades, leading to low reproduction rates. According to the authors, refuges of Golden eagles are still to be found in major mountain ranges in the Northern part of the island, namely Perolitani, Nebrodi, Madonie and Sicani.

According to data provided by Dunnett et al. (2020), 56 wind farms and 683 turbines are operating across the area. According to the data available, at least 5 wind farms and 63 turbines are located within designated Sicilian Bird Protection Areas. An overview of spatial relations is provided in Figure 6.

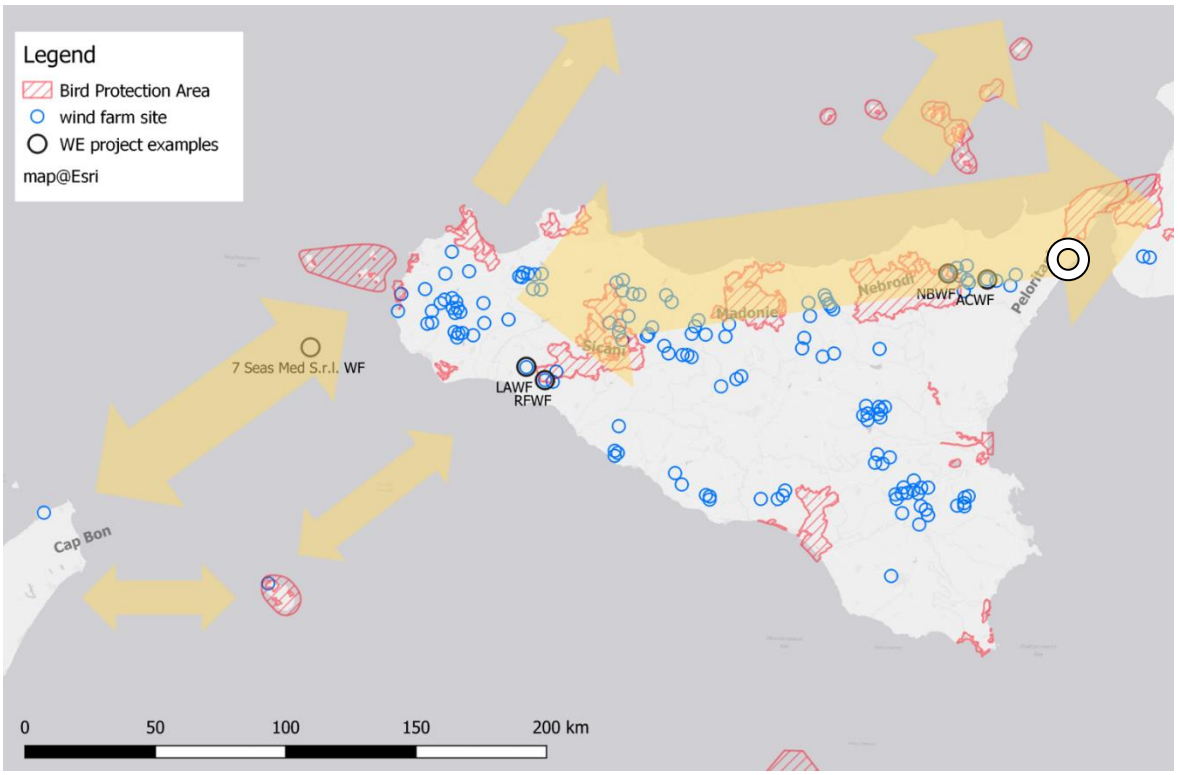

Figure 6. Spatial relation of SPAs, important migration routes of Honey buzzard and other soaring birds (yellow arrows according to Agostini & Panuccio 2005, Agostini et al. 2016) and wind energy development at Sicily. The white circle marks the location of observation sites in the Peloritani mountains reported by Corso (2001). 7 Seas med S.r.l. WF (25 turbines), LAWF=Lago Arancio WF (22 turbines), RFWF=Rocca Ficuzza WF (26 turbines), NBWF=Nebrodi WF (56 turbines), ACWF=Alcantara WF (56 turbines).

Public availability of documents on the commissioning and Environmental Impact Assessment of Sicilian wind energy projects is very limited. However, the report by ERM (2015) "Environmental Due Diligence (EDD) of Mezzogiorno Wind Farm Portfolio (Sicily and Apulia, Italia)" outlines the wind farm projects Alcantara (56 turbines), Lago Arancio (22 turbines), Nebrodi (56 turbines) and Rocca Ficuzza (26 turbines). Although Nebrodi wind farm is at least partially situated within the Bird Protection Area ITA030043 "Monti Nebrodi", no EIA has been performed. In the case of Rocca Ficuzza, the entire wind farm is situated within the Bird Protection Area ITA020048 "Monti Sicani, Rocca Busambra e Bosco della Ficuzza" and according to ERM (2015) an EIA has been performed in 2003. As a consequence 5 of 31 initially planned turbines did not gain permission due to unspecified "*(…) flora and environmental protection issues*".

There is no specification of assessment methods or potentially affected species in the ERM report. All mentioned wind farms have been commissioned in 2007 or 2008 and a collision monitoring program has been carried out in 2013 and 2014. No specification of methodology nor a substantial summary of the assessment results has been published. The results of a collision monitoring program provided by ERM (2015) are shown in Table 4. Consequently, the projects impact due to collision mortality has been considered to be insignificant.

Table 4. Results of the collision monitoring carried out at Sicilian Mezzogiorno wind farms in 2013 and 2014, as provided by ERM (2015). CMR = annual collision mortality rate.

Wind farm	turbines	2013	2014	CMR
Alcantara	56	0	0	0
Lago Arancio	22	0	0	0
Nebrodi	56	some collisions reported [sic!]		?
Rocca Ficuzza	26	1	0	0.02

In the EDD report (ERM 2015) a second collision monitoring is recommended for all wind farms to comply with due diligence. The authors do not mention any other potential impact types that might be relevant for comprehensive impact assessment. No further details on methods or results of impact assessment have been published. Even though Italy is a founding member state of the European Union and potentially affected SPAs at Sicily were designated long before the wind farms were even planned, fundamental EIA standards have obviously not been applied in the commissioning process.

Currently, concession is sought for Italy's first floating wind farm (25 x 10 MW turbines) in the Strait of Sicily by the company 7 Seas Med S.r.l. (Durakovic 2020). The considered facility site is shown in Figure 6 and lies at the bottleneck of South Central European soaring bird migration (Agostini et al. 2000, 2016; Agostini & Panuccio 2005). Considering the results from raptor observations at the Baltic Sea (Skov et al. 2015), migration traffic will mainly occur in the risk zone (< 200 m altitude) of the wind farm.

9.3. Baltic Sea

Another bottleneck site in Europe is located around Falsterbo, a peninsula in the very South of Sweden. The narrow strait to the south is frequented by large numbers of soaring land birds during the migration season. With bird migration observations starting as early as in the 1940s, a continuous series of counts is running since 1973. The population of Common crane *Grus grus* migrating from Scandinavia to Western and Central Europe is estimated at 240,000 individuals (Mewes et al. 2010). According to Prange (2005), 50,000 individuals aggregate in the Ruegen-Bock area (Northern Germany) every autumn, which indicates that they must have crossed the waterbody of Arkona Basin, before (see Figure 7).

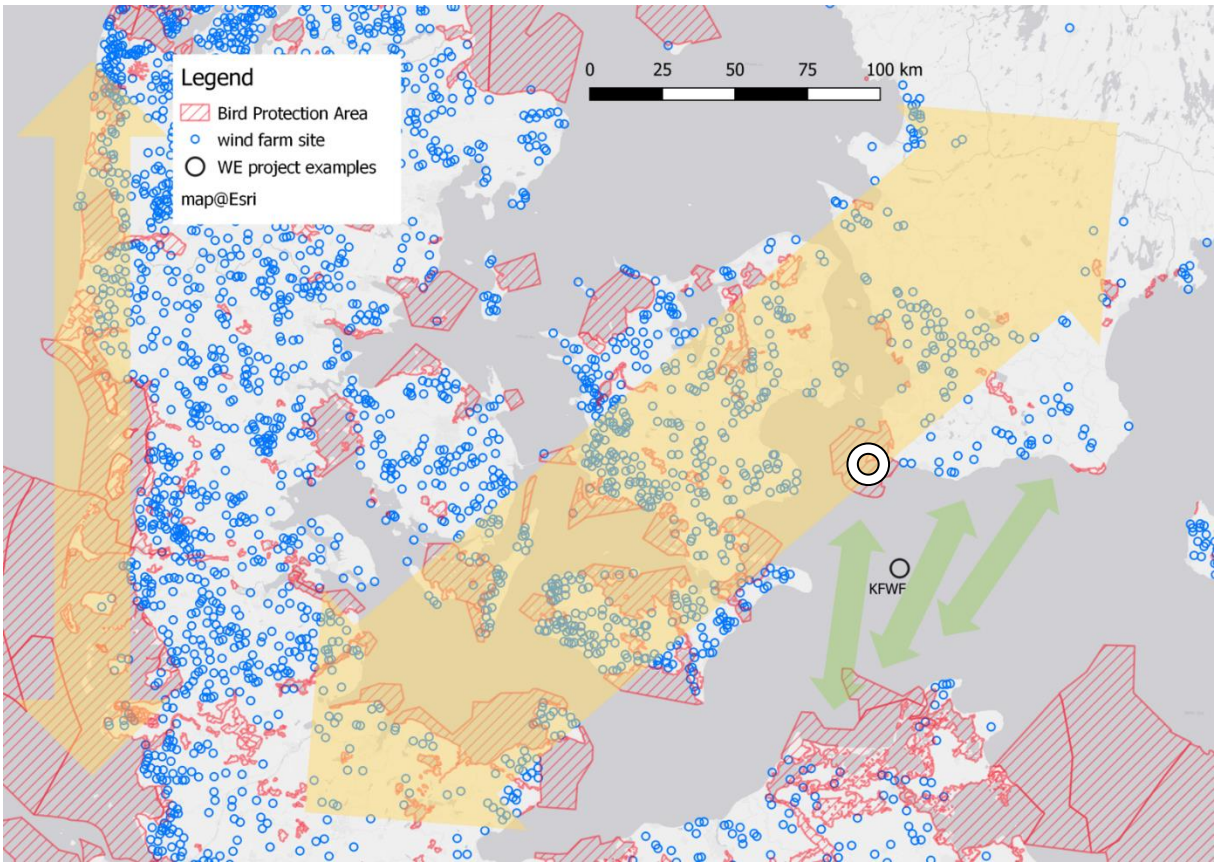

Figure 7. Core migration flight paths of soaring landbirds (yellow arrows) at the Western Baltic Sea according to Koop (2004). According to Skov et al. (2015), the direct passage of Arkona Bay (green arrows) is chosen by the vast majority of cranes and a share of migrating raptor species (2.7 - 37 % depending on the species). Cranes aggregate at Ruegen-Bock SPAs, therefore many of them have to cross the Kriegers Flak Wind Farm site.

Within their flight corridor, installation of a 600 MW wind farm at the sandbank of Kriegers Flak Wind Farm site is planned to start in 2020. Skov et al. (2015) from Danish Center for Environment and Energy (DCE) at Aarhus University prepared the report "Birds and Bats at Kriegers Flak. Baseline investigations and impact assessment for establishment of an offshore wind farm" as part of the Environmental Impact Assessment.

The report combines existing knowledge of the sensitivity of potentially affected species (water birds, migrating raptors and cranes) to habitat displacement, barrier effects and collision risks, including a dedicated one-month study of behavioral responses of Common Crane to the close-by and already operating Baltic 2 wind farm conducted in Spring 2015. In the international perspective, the Common Crane is the most important species in relation to the assessment. In the assessment, the Potential Biological Removal (PBR) concept was applied to identify significance of collision mortality.

According to the authors, the cross-sectional diameter of Kriegers Flak Wind Farm site will span roughly 13% of the width of the Arkona Basin. Presuming an evenly distributed migration of cranes across the

basin, 6,500 ind. Will directly pass the wind farm, which equals 2.7% of the Scandinavian population. Under the same assumption, Skov et al. (2015) calculated the projects collision mortality according to the Band model (Band et al. 2012) with case specific modification of model parameters and estimated a collision rate for Common cranes at the wind farm of 216 – 296 individuals per year.

However, it should be mentioned, that the cranes flight corridor narrows when approaching Ruegen island, even before they pass the project area as indicated in Figure 7. At one point in fact, Skov et al. (2015) suggest, that "*based on data from satellite tagging programs the entire Swedish and Norwegian populations of Common Crane are expected to cross the region* [central part of Arkona Bay and Kriegers flak project area]". Hence, the previous numbers might significantly underestimate the actual migration and collision rates of cranes.

This aspect is also mentioned by the authors ("*It should be stressed that these estimates rest on two assumptions which if proven wrong could cause the number of collisions to increase above the PBR threshold.").* Nevertheless, the considerable residual risk of project-specific and cumulative impacts on Common cranes is taken and has as such been accepted by authorities in Sweden, Denmark and Germany.

The assessment of potential impacts on migrating raptors was mainly based on range finder tracking data obtained during 11 days of spring migration and 27 days of autumn migration in 2013 to derive the proportion and altitude of migrating cranes and raptors, heading towards the project area.

Due to the small sample size obtained during a short period of a single autumn migration season, range finder tracking data provided limited information on general migration behavior of cranes and raptors. Migration monitoring data obtained during about one third of a single season do not represent the possible variability of flight behavior from season to season. For example, autumn migration counts of Sparrowhawks at Falsterbo varied between 13,478 in 2002 to 45,296 ind. in 2012 (Karlsson 2019 at www.falsterbofagelstation.se). Considering the variability of migration traffic, it is also likely, that flight corridors vastly change between seasons.

In a subsequent study Skov et al. (2016) presented indications for attraction of soaring migrants to offshore wind farms, which would affect migration behavior and additionally increase the potential impact of Kriegers Flak Wind Farm site due to collision risk.

For their calculations of migration traffic at the project site, Skov et al. (2015) used migration traffic reports from Falsterbo provided by Karlsson et al. (2004), even though consecutive autumn migration monitoring has been performed at Falsterbo for decades (and as well from 2004 to 2013). In 2013, when range finder data were obtained, the seasonal migration traffic of Sparrowhawks at Falsterbo

was 61.9% higher than the postulated average of 16,000 individuals reported by Karlsson et al. (2004) reaching a total of 25,908 individuals. According to the numbers on autumn migration available from www.falsterbofagelstation.se, passage through the wind farm risk zone could be significantly higher than reported in the EIA for all assessed raptors except the Honey buzzard (see Table 5).

Table 5. Comparison of outdated primary data and results provided in EIA by Skov et al. (2015) to updated estimates based on data that has already been publicly available during conduction of the EIA. The worst case estimate is based on the latest data available from Falsterbo Bird observation (Karlsson 2019). IUCN EU redlist categories: LC = Least concern, NT = Near threatened.

		MTRa at Falsterbo		**Proportion of migrants crossing Arkona Basin**	**MTRa across Arkona Basin and Kriegers Flak Wind Farm site**	
		Data used for EIA estimates	**Maximum counts (since 2004)**	**Data used for EIA estimates**	**EIA estimate**	**worst case estimate**
Data source	IUCN EU	Karlsson (2004)	Karlsson (2019)	Skov et al. (2015)	Skov et al. (2015)	
species						
Honey buzzard	LC	7,500	**7,479** (2011)	2.7 %	203	**201 (-0.5%)**
Sparrowhawk	LC	16,000	**45,296** (2012)	5 %	800	**2,250 (+181.3%)**
Rough-legged buzzard	LC	930	**2,380** (2011)	13 %	121	**309 (+155.4%)**
Red kite	NT	500	**4,574** (2017)	12 %	60	**549 (+915.0%)**
Osprey	LC	241	**489** (2005)	17 %	40	**83 (+107.5%)**
Hen harrier	NT	280	**471** (2011)	37 %	104	**174 (+67.3%)**

This applies to the Hen harrier *Circus cyaneus* and especially the Red kite *Milvus milvus*, both categorized as "Near threatened" in Europe. For the latter highly wind energy sensitive species, calculation of migration traffic in the risk zone of Kriegers Flak Wind Farm site based on more recent data could be almost 10 times higher than reported by Skov et al. (2015).

Though environmental impacts of Kriegers Flak Wind Farm site are assessed to be insignificant, the authors mention, that "*detection systems based on radars and cameras/observers which would inform when movements of Common Crane are approaching the wind farms* [represents the most] *efficient means for reducing the collision risk*". The authors do not propose to include migrating raptors into the list of target species, even though they admitted, that if their assumptions were wrong, collision mortality could increase above the threshold where it has impacts on the population status

10. Methodology of impact assessment

As a first step a scoping process was conducted to assess the size, scope, content, and availability of the available evidence. The scoping process also includes field trips to the study area in particularly relevant periods such as during spring migration/breeding period and autumn migration period. The next step was the elaboration of a methodological protocol (Activity 1) that elaborated the specific methodological details for the full assessment on the topic in a rigorous, transparent, and reproducible way. Such a protocol is essential to minimize bias that might result for instance from spontaneous methodological decisions made by the reviewer (CEE 2013). Here also the definitive scope of the assessment was operationalized in collaboration with selected stakeholders in order to maximize relevance and targetedness.

The assessment is dealing with the syntheses of evidence for impacts of the wind farms on birds in the Kaliakra area. In doing so, the following kinds of impact are differentiated:

- collision,
- displacement,
- barrier effects,
- disturbance, and
- habitat change.

In detail, the questions are: (i) what is the impact on different taxa or guilds of birds, (ii) are there any differences of impact among different wind parks and wind turbines in the area (cf. Wang et al. 2015), (iii) and what is the effectiveness of mitigation measures applied and potentially available (Birdlife International 2013, Marques et al. 2014, May et al. 2015, Zehtindjiev 2020).

The geographical focus is limited to the wind parks of the area of Kaliakra.

Given the good collaboration with the most important stakeholders (MOEW, operators, NGOs), the collection of evidence for impacts of the Kaliakra wind farms could be reduced to the documents provided by the stakeholders. Plenty of documents were provided by the operators (Table 6) and by the NGO Bulgarian Society for the Protection of Birds (BSPB) (Table 7).

Table 6. Documents provided by the operators (for full references see Chapter 14).

Author(s)	Title	Publication year
Zehtindjiev	Review of the current stage knowledge and results of long-term monitoring of Wind farms in region of Kaliakra –Via Pontica (Bulgaria). Final report.	2020
Traxler et al.	Ornithological survey in EVN windfarm Kavarna and adjacent areas in autumn 2015 Part 1: Diurnal Bird migration. Part 2: Collision monitoring	2020
Zehtindjiev & Whitfield	Monitoring of the migration of birds through the territory of the Integrated System for Protection of Birds, Autumn 2019	2019
Zehtindjiev	Monitoring of the migration of birds through the territory of the Integrated System for Protection of Birds in the region of SPA Kaliakra Autumn 2018	2018
Zehtindjiev	Monitoring of spring bird migration in the Integrated System for Protection of Birds	2018
Zehtindjiev	Monitoring of geese in the territory of Integrated System for Protection of Birds and the Kaliakra SPA BG0002051 in winter 2018/2019	2018
Zehtindjiev & Whitfield	Bird migration monitoring in the Saint Nikola Wind Farm, Kaliakra region, in autumn 2017, and an analysis of potential impact after eight years of operation	2017
Zehtindjiev & Whitfield	Monitoring of wintering geese in the AES Geo Energy Wind Farm "St. Nikola" territory and the Kaliakra region in winter 2016/2017	2017
Zehtindjiev & Whitfield	Summary of Activities and the Results of Ornithological Monitoring in 2017	2017
Zehtindjiev & Whitfield	Bird migration monitoring in the Saint Nikola Wind Farm, Kaliakra region, in autumn 2016, and an analysis of potential impact after seven years of operation	2016
Zehtindjiev & Whitfield	Monitoring of wintering geese in the AES Geo Energy Wind Farm "St. Nikola" territory and the Kaliakra region in winter 2015/2016	2016
Zehtindjiev & Whitfield	Summary of Activities and the Results of Ornithological Monitoring in 2016	2016
Zehtindjiev & Whitfield	Bird migration monitoring in the Saint Nikola Wind Farm, Kaliakra region, in autumn 2015, and an analysis of potential impact after six years of operation	2015
Zehtindjiev & Whitfield	Monitoring of wintering geese in the AES Geo Energy Wind Farm "St Nikola" territory and the Kaliakra region in winter 2014/2015	2015
Zehtindjiev & Whitfield	Summary of Activities and the Results of Ornithological Monitoring in 2015	2015
Zehtindjiev & Whitfield	Bird migration monitoring in the Saint Nikola Wind Farm territory, Kaliakra region, in autumn 2014, and an analysis of potential impact after five years of operation	2014
Zehtindjiev & Whitfield	Monitoring of wintering geese in the AES Geo Energy Wind Farm "Sveti Nikola" territory and the Kaliakra region in winter 2013/2014	2014
Zehtindjiev & Whitfield	Bird migration monitoring in the Saint Nikola Wind Farm territory, Kaliakra region in autumn 2013, and analysis of potential impact after four years of operation	2013

Zehtindjiev & Whitfield	Monitoring of wintering geese in the AES Geo Energy Wind Farm "Sveti Nikola" territory and the Kaliakra region in winter 2012/2013	2013
Reichenbach, Steinborn, Jachmann	Ornithological Expertise concerning the Saint Nikolai Wind Farm - Evaluation of monitoring results and assessment of actual impact	2012
Zehtindjiev & Whitfield	Bird migration monitoring in the AES Geo Power Wind Park territory, Kaliakra region, in autumn 2012, and analysis of potential impact after three years' operation	2012
Zehtindjiev & Whitfield	Saint Nikola Wind Farm: 2012 Breeding Bird Survey	2012
Zehtindjiev & Whitfield	Monitoring of wintering geese in the AES Geo Energy Wind Farm "Sveti Nikola" territory and the Kaliakra region in winter 2011/2012	2012
Zehtindjiev & Whitfield	Bird migration monitoring in the AES Geo Power Wind Park territory, Kaliakra region, in autumn 2011, and an evaluation of a potential "barrier effect" after two years of operation	2011
Zehtindjiev & Whitfield	Monitoring of wintering geese in the AES Geo Energy Wind Farm Sveti Nikola" territory and the Kaliakra region in winter 2010/2011	2011
Zehtindjiev & Whitfield	Bird migration monitoring in the AES Geo Power Wind Park territory, Kaliakra region, in autumn 2010	2010
Zehtindjiev	Saint Nikola Wind Farm: 2010 Breeding Bird Survey	2010
Zehtindjiev & Whitfield	Monitoring of wintering geese in the AES Geo Energy Wind Park "Sveti Nikola" territory and the Kaliakra region in winter 2009/2010	2010
Zehtindjiev & Whitfield	Saint Nikola Wind Farm: bird migration monitoring in autumn 2009	2009
Zehtindjiev	Saint Nikola Wind Farm: 2009 Breeding Bird Survey	2009
Zehtindjiev et al.	The monitoring of the wintering geese in the AES Geo Energy Wind Park "Sveti Nikola" territory and the Kaliakra region in winter 2008/2009	2009
Zehtindjiev	The bird migration monitoring in the AES Geo Power Wind Park territory, Kaliakra region in autumn 2008	2008

Table 7. Documents provided by the NGO Bulgarian Society for the Protection of Birds – BSPB (for full references see Chapter 14).

Author(s)	Title	Publication year
Zarkov	Study on the local movements of wintering birds in the region of Primorska Dobrudja from the point of view of the development of wind energy facilities	2014
Petkov et al.	Overview of the importance of coastal Dobrudga for the conservation of the globally threatened red-breasted good (*Branta rufficollis*) and other wintering geese and the impact of windfarm development	2012
BSPB	Overview of the reduced SPAs under the infringement procedure 2007/4850 against Bulgaria for insufficient designation of 6 IBAs as SPAs	2011

BSPB	Update on the infringement cases based on complaints to EC Nu 4850(2007), 4461(2008) and 4260(2008) provided by the Bulgarian Society for the Protection of Birds/BirdLife Bulgaria	2011
BSPB	Overview of main EU level actions taken between 19 September 2007 and 1 March 2011 in relation to infringement procedures of the European Commission against Bulgaria 2007/4850 (insufficiency designation); 2008/4260 (inadequate protection of Kaliakra IBA) and 2008/4461 (lack of preventive protection for SPAs)	2011
BSPB	National level actions taken between 1 October 2009 and 1 March 2011 in relation to infringement procedures of the European Commission against Bulgaria 2007/4850 (insufficiency designation); 2008/4260 (inadequate protection of Kaliakra IBA) and 2008/4461 (lack of preventive protection for SPAs)	2011
BSPB	Wind farms in Coastal Dobrudzha - 15 km inland from the Black Sea Coast – operational, approved and planned by 1 March 2011	2011
Anonymous	Discussion paper Wind Farm of EVN in Kavarna, Bulgaria	2010
BSPB	Kaliakra IBA (IBA BG051) – assessment of the IBA territory compared to the territory of Kaliakra SPA; significance of the excluded territories	2010
BSPB	Kaliakra IBA (IBA BG051) – assessment of the IBA territory compared to the territory of Kaliakra SPA; significance of the excluded territories	2010
BSPB	Letter by BSPB to MOEW (in Bulgarian) with the short report "Large scale migration of Red-footed falcon *Falco vespertinus* over Kaliakra (NE Bulgaria)" attached.	2010
Hoogweg	Monthly ornitological report of St Nikola Wind Farm, September 2010	2010
Mateeva & Pullan	Analysis of paper provided by EVN to BSPB on “Kavarna” wind farm case for internal use	2010
Zethindjiev	Justification for strengthening the Natura 2000 network for birds in the region of Kaliakra (Northeastern Bulgaria)	2010
Haslinger et al.	Rechtsgutachten zur Beurteilung einer Projektänderung aus Sicht des europäischen UVP-Regimes	2009
Ratzbor	Naturschutzfachliches Kurzgutachten zum Kenntnisstand von Auswirkungen größerer Rotordurchmesser auf die Tierwelt	2009
Zethindjiev	The monitoring of the wintering geese in the AES Geo Energy Wind Park “Sveti Nikola” territory and the Kaliakra region in winter 2008/2009	2009
Zethindjiev	Monitoring of wintering geese in the AES Geo Energy Wind Park “Sveti Nikola” territory and the Kaliakra region in winter 2009/2010	2009
Karaivanov	Report about the conducted “Monitoring study on the autumn bird migration in the region of the villages of Bulgarevo and Sveti Nikola, Kavarna Municipality, in 2006”	2006
BSPB	Observation of autumn migration of soaring birds in Bulgaria in 2004 in terms of identification of bottleneck IBAs to be included in the European Ecological Network NATURA 2000	2005

Karaivanov	Report about the carried out Ornithological and ornithocenological research on the autumn migration of the birds in the region of the villages of Bulgarevo and Sveti Nikola, Kavarna Municipality	2005
Karaivanov	Report regarding the carried out Monitoring on the spring migration of birds in the region of the village of St. Nikola, Kavarna municipality	2005
Karaivanov	Report on the carried out "Monitoring study on the autumn migration of birds in the territory of Kavarna Municipality" during teh period 15.08.-15.11.2004	2004
BSPB	National Action Plan - *Branta ruficollis*	2002
Dereliev et al.	The numbers and distribution of Red-breasted Goose *Branta ruficollis* at winter roosts in Romania and Bulgaria	2000
Dereliev	Monitoring of Red-breasted geese in Bulgaria in the 1990s	1998
Iankov & Michev	The Bulgarian Ornithofauna	1998
Hunter & Black	International Action Plan for the Red-brested Goose (*Branta ruficollis*)	1995
Annonymous	Overview of Decommissioning Costs and the Second-Hand Market for Wind Turbines	?
Shurulinkov	Report on the study of bird mortality in the wind farm "Kaliakra", October-November, 2009-11-17	unpublished

In the frame of the assessment these documents were used to assess the impact of the wind farms on birds. Further evidence was taken from references listed in the reference lists of the provided documents. Additionally, international studies were used, mainly for general statements and comparison with other wind power areas.

11. Consultation results

11.1. Assessment of collision mortality impacts

The occurrence of migratory bird species near the 240 wind turbines operating in the Municipality of Kavarna during autumn migration bears a risk of increased collision mortality rates during rare and specific weather conditions, when migrating birds occur in the wind farms with elevated densities. This collision risk was assessed by collision victim searches at Kaliakra wind farm, St Nikola wind farm and EVN wind farm. According to collision monitoring reports, collision mortality rate in the Kavarna wind farms varied between 0.02 - 7 birds /turbine and autumn season (Zehtindjiev 2020). The high variation was related to differences among turbine sites, annual variation and methodological differences in protocols and data processing applied during monitoring programs.

11.1.1. Kaliakra wind farm

In the Kaliakra wind farm (35 turbines arranged in three rows at an inter-row spacing of approximately 900 m, and in-row spacing not exceeding 250 m), during a total of 940 systematic carcass searches covering 12 months from 1.07.2008 to 01.07.2009 one dead white pelican (*Pelecanus onocrotalus*) was found 24th of October 2008, the death cause remained uncertain. A further subadult white pelicans was observed in bad physiological and found dead without visible signs of collision. On the 04th and 18th of April 2009, two collided corn buntings (*Miliaria calandra*), both confirmed as collision victims were registered.

Only very few collided birds were detected. However, due to methodological reasons (mainly long intervals between searches of one month per turbine, no carcass removal trials and application of correction factors, monitoring during one year only), collision mortality rates cannot be calculated for Kaliakra wind farm and rough estimates should not be overstressed. It can only be concluded that in the one year of monitoring, probably no severe mass collision event did occur.

11.1.2. Sveti Nikola Wind Farm

In the 52 wind turbines of Sveti Nikola Wind Farm (SNWF), a collision monitoring based on the guidelines by Morrison (1998) was launched in 2010. In total, 156 collision victims were estimated for autumn and winter during 8 years of operation from August 2010 until March 2018. Eighty-one (81) collision victims, roughly the half, were found during the searches, the remaining ones were estimated based on the results of the carcass detection trials implemented in the wind farm. This results in an annual rate of 0.375 lethal collisions per turbine and to an estimate of 0.05 to 0.26 lethal collisions per autumn season.

Most collided birds species are not considered to be wind energy sensitive. Passerines were the most frequent collision victim with a proportion of 69 % of total fatalities. Water birds and gulls accounted for 13 %, raptors (mainly Common buzzards) made up 9 %, rails 6 % and partridges 3 % of the carcasses (Zehtindjiev 2020). Collision events of target raptor species were reported for autumn 2010 (one Griffon vulture *Gyps fulvus* and one Sparrowhawk *Accipiter nisus*) and autumn 2014 (one Red-footed falcon *Falco vespertinus*). Carcasses of 4 Common buzzards (*Buteo buteo*), 2 Common kestrels (*Falco tinnunculus*) and one Eurasian scops owl (*Otus scops*) represent the only other raptor and owl species found during the study period. Individuals of potentially sensitive or target species other than raptors that were found dead due to collision included a Corn crake (*Crex crex*) in autumn 2014 and a Purple heron (*Ardea purpurea*) in 2015. Apart from that, no carcasses of storks, pelicans, other large soaring birds such as or geese species etc. were attributed to turbine collisions during the 8 years of carcass monitoring at SNWF.

At SNWF, the estimated worst-case collision mortality of raptors (on average 12 individuals for the whole wind farm during autumn and winter season) based on long-term carcass searches shows that the operation of SNWF does not result in mass fatalities of target raptor species. From the results obtained during collision monitoring at SNWF it can be concluded, that mitigation of target species collision mortality in autumn (summarized in Table 8) and winter (no observed collision of geese) by has fullfilled the expectations.

Table 8. Conservative predictions of collision mortality made pre-construction under the Band et al. (2007) model and assuming a low avoidance rate of 95% for key species regularly present at St Nikola Wind Farm in comparison to reported collision mortality under operational turbines. BAS= Bulgarian Academy of Science; BSPB= Bulgarian Society for the Protection of Birds; AES SNWF = AES St Nikola Wind Farm (after Zehtinjiev 2020)

	Collision modelling with pre-construction data				**Detected collisions**
Species	**Predicted annual collisions**		**Predicted total collisions 2010 - 2017**		**Observed collisions 2010 - 2017**
	BAS data	BSPB data	BAS data	BSPB data	AES SNWF data
White Stork	14.6	86.1	117	689	0
White pelican	0.26	1.58	2	12.6	0
Honey buzzard	0.27	0.9	2.2	7.2	0
Lesser spotted eagle	0.09	0.15	0.7	1.2	0

It might surprise (but at the same time matches the results from elsewhere; e.g. De Lucas et al. 2008, Ferrer et al. 2012) that high abundance of birds or presence and passage of large flocks did not correlate with the number of carcasses found at the wind farm. During seasons of extraordinary aggregations of migrating target species (e.g. in autumn 2010, 2013 and 2014), collision mortality did not increase for the most abundant species. This patterns is heavily discussed in the scientific literature (e.g. De Luca et al. 2008, 2012, Marquez et al. 2014), and seemingly specific conditions (location and topography of the site, whether conditions in times of mass migration, condition of the birds in times of mass migration), are particularly relevant factors, beside the number of birds alone.

11.1.3. Collision mortality at EVN Wind Farm in autumn 2015

A bird migration monitoring was conducted in the EVN Windfarm plus three surrounding control points during autumn migration season 2015, totaling at all four points 185 field days during a time span of 74 days from 20th of August to 1st of November 2015 (Traxler et al. 2020). Also a collision monitoring was conducted in EVN Wind farm during the same time span (Traxler et al. 2020). The search of bird and bat collision victims underneath the wind turbines (100 m radius) was performed every second day of the study along linear transects. Each turbine was visited 37 times and searched for approximately one hour during a total of approximately 300 h of field work. Collision rates were estimated considering factors such as the proportion of searchable area, specific search efficiency and carcass removal rate.

During the bird migration monitoring, a total of 117,893 individual birds our of 163 bird species were registered, thereof e.g. 68,395 Common Chaffinches, 32,064 Starlings, 13,681 European Bee-eaters, 10,035 Common Buzzards, and 8,236 White Pelicans (Appendix 1 of Traxler et al. 2020). A total number of 21 birds of 15 different species were found underneath the turbines of the EVN wind farm, mainly in the first half of the survey period – end of August till end of September. The collision rates per turbine (compare Korner-Nievergelt 2015) were moderate, i.e. 4.5 overall collision rate for birds per wind turbine, thereof, small birds have the highest proportion with 2.6 collisions per turbine, medium birds are also regularly colliding at the turbines (at rates of 1.4 collisions per turbine), large birds have a lower collision rate of 0.5 collisions per turbine. Collided species were (in chronological order of detection): Barn Swallow (*Hirundo rustica*), Red-backed shrike (*Lanius collurio*), Robin (*Erithacus rubecula*), House martin (*Delichon urbicum*), Grey partridge (*Perdix perdix*), Streetdove (*Columba livia*), Marsh harrier (*Circus aeruginosus*), House martin (*Delichon urbicum*), Nightjar (*Caprimulgus europaeus*), Corn bunting (*Emberiza calandra*), Magpie (*Pica pica*), Song thrush (*Turdus philomelos*), Common swift, (*Apus apus*), Corncrake (*Crex crex*), Yellow-legged gull (*Larus michahellis*), and Blackbird (*Turdus merula*) (Table C2 in Traxler et al. 2020). Apart from migration intensity, collision rates depended on the location of turbines and other factors. The turbine with the highest collision rate (7 birds) was located in the eastern part of the wind farm, near the road connecting the cities Kavarna and Bulgarevo.

11.1.4. Collision mortality: summary

The findings from SNWF and EVN wind farm collision monitoring in autumn and winter show, that avian mortality is not extraordinarily high in comparison to collision rates typically encountered at operating turbines in other well-developed wind energy regions. Regular mass fatalities could be disproved. Observed mass aggregation of storks and other target species did not lead to fatalities. Neither a fatality was registered for Red-breasted geese foraging in Kaliakra SPA. The chance of missing the large carcasses is low.

In general, as evidenced by data from other wind farms, mass collision events are rare at wind power facilities, but can occur under particular circumstances (Johnson et al. 2002, Kerns and Kerlinger 2004, American Bird Conservancy 2011, Aumüller et al. 2011). Therefore, little impact on migrating birds can only be granted by continuous conduction and improvement of the EWS and the monitoring activities. In particular, care has to be taken to totally avoid mass collision events that do not occur frequently, but might occur one point of time.

Impact Assessment Collisions

Impact on birds:

Due to the low number of collision victims found below turbines at St. Nikola wind farm (autumn, winter) and EVN wind farm (autumn), a significant increase of avian mortality at Kaliakra SPA due to local wind energy projects is not indicated. This is especially true for target species of special conservation concern at Kaliakra SPA. Autumn migration at Kaliakra SPA is not significantly affected by the local wind energy projects. Mass collision events occurred in other wind farms under very particular circumstances. Their potential future occurrence in the wind farms of the Kaliakra must be mitigated by appropriate mitigation measures.

Reduction potential, e.g. through mitigation measures:

Turbine curtailment during the presence of target species is required to minimizes the risk for letal collisions of migrating, wintering or breeding target species. The low collision mortality at Kaliakra SPA wind turbines suggests a high efficiency of turbine curtailment in response to potential risk situations.

11.2. Assessment of other impact types

11.2.1. Displacement

11.2.1.1. Red-breasted Geese in Kaliakra and neighboring regions

A particularly relevant species potentially suffering displacement, and object of heavy controversies, is the Red-breasted Goose (*Branta rufficollis*). According to the monitoring presented by Illiev & Petkov (2015), average duration of presence of Redbreasts in numbers higher than 10 000 birds in the Bulgarian Dobruzha is almost one month or a bit over 25 days per winter. Further 15 days on average per winter they are present in numbers from 5 000 to 10 000 birds, numbers in November and late March being always bellow 1000 birds. During pre- and post-construction observations, maximum numbers of Red-breasted geese fluctuated from several hundreds to more than 10,000 individuals per wintering season (Zehtindijev 2020).

Pre-construction counts during the period 1995 – 2000 resulted in 5 to 157 Red-breasted geese registered in Kaliakra and neighboring regions by Dereliev et al. (2000), only in winter 1995/96, the species could be recognized once at the later St Nikola wind farm project area (Figure 8).

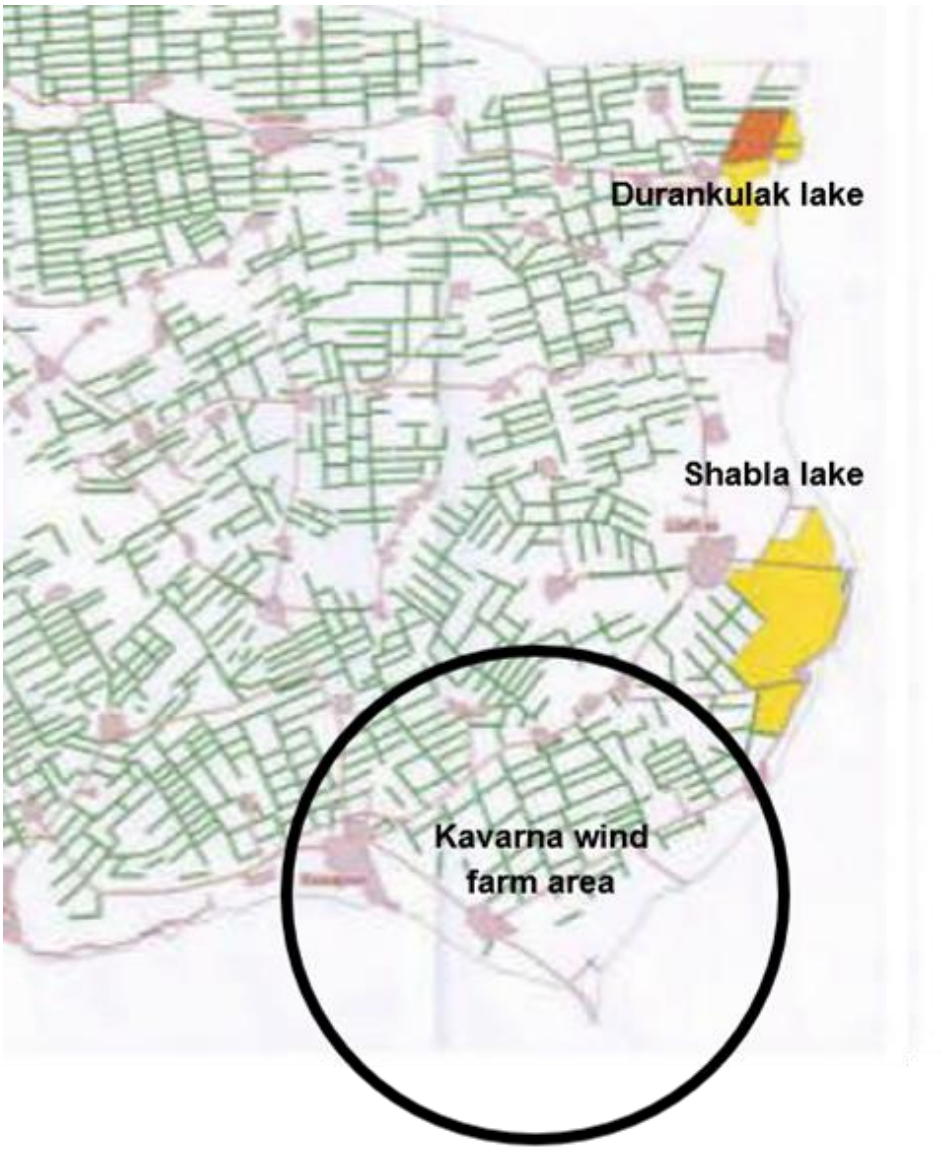

Figure 8. Subsection of the original map by Dereliev et al. (2000): The most important foraging/roosting habitats are marked in orange. Yellow areas indicate additional foraging/roosting sites of wintering geese, the later project area was not considered to host important habitats of wintering Red-breasted geese.

After construction of the wind farms, in the study "Safety Grounds for Red-breasted geese" (European Commission 2015), the importance of habitats for Red-breasted Geese was assessed (see Figure 9).

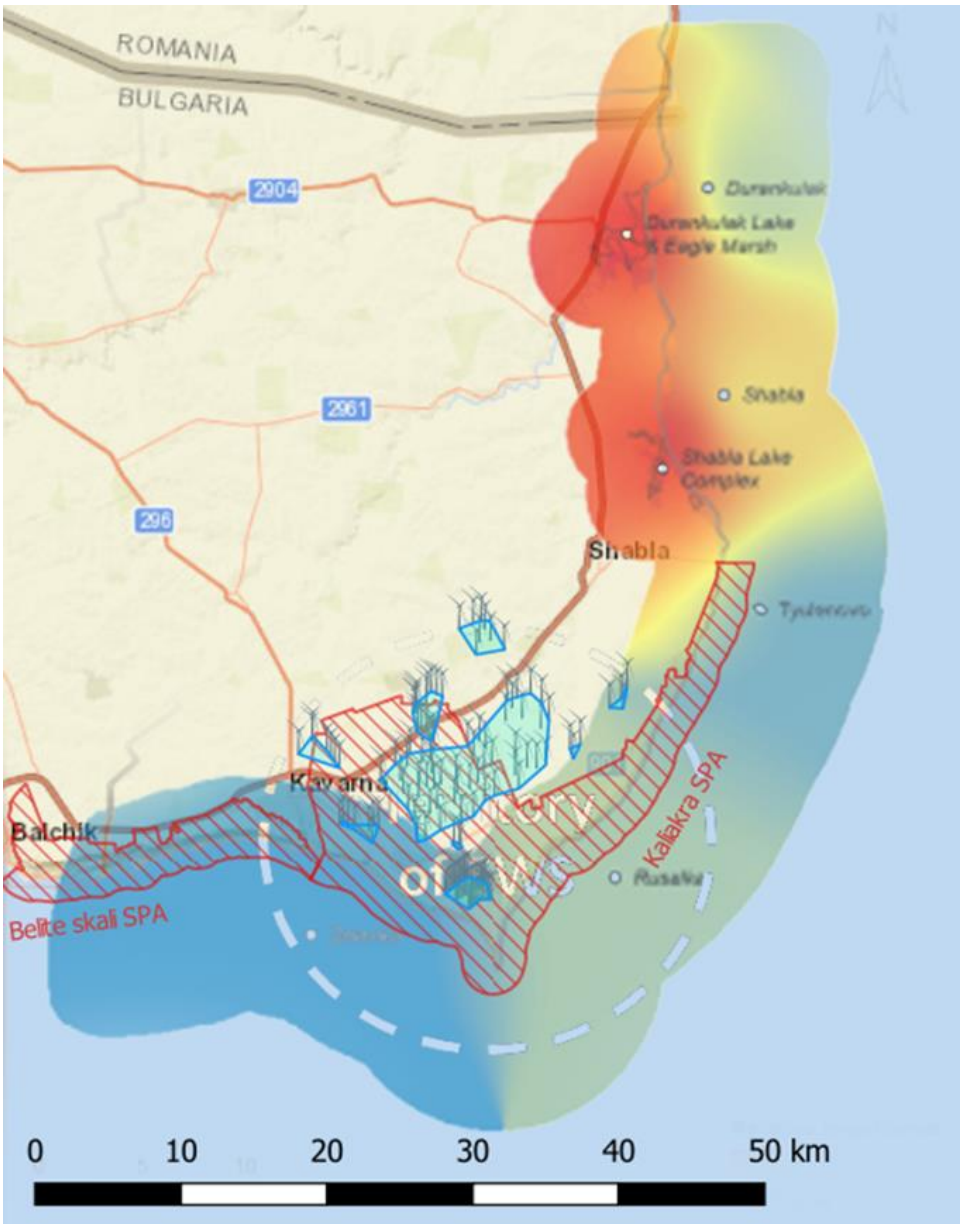

Figure 9. Visualization of the results of Life + project "Safety Grounds for Red-breasted geese" (European Comission 2015). Highly important habitats shaded red, medium yellow and low green/blue.

Evaluations of potential displacement and barrier effects on wintering geese were reported by Zehtendjiev & Whitfield (2011a, b, 2012b) in their reports "Monitoring of wintering geese in the AES Geo Energy Wind Farm "Sveti Nikola" territory and the Kaliakra region in winter 2011/2012", "Bird migration monitoring in the AES Geo Power Wind Park territory, Kaliakra region, in autumn 2011, and an evaluation of a potential "barrier effect" after two years of operation", and "Monitoring of wintering geese in the AES Geo Energy Wind Farm Sveti Nikola" territory and the Kaliakra region in winter 2010/2011".

First evaluations of potential displacement and barrier effects on wintering geese were reported by Zehtendjiev & Whitfield (2011a, b, 2012b) in their reports (i) Bird migration monitoring in the AES Geo Power Wind Park territory, Kaliakra region, in autumn 2011, and an evaluation of a potential "barrier effect" after two years of operation, and (ii) Bird migration monitoring in the AES Geo Power Wind Park territory, Kaliakra region, in autumn 2012, and analysis of potential impact after three years' operation. Both studies did not reveal any significant effects on Red-breasted geese (Zehtindjiev 2020).

Also Petkov et al. (2012) report on the distribution of the Redbreasted Geese and other wintering geese prior to the windfarm development in Dobrudzha. The distribution of the foraging grounds of the geese was predominating in the area of Shabla Lakes Complex SPA and the area of Kavarna Municipality. The data collected by Dereliev (2000) showed the importance of the crop fields in Kavarna area, including near Kaliakra SPA and the coast up North. Petkov et al. (2012) explains that Dereilev (2000) assigned as key/important fields those that at least 2 years during the study hosted flocks of over 1000 Red-breasted geese, but also other fields were relevant, despite not matching the arbitrary threshold of ">1000 individuals twice". Recently, according to Petkov et al. (2012) significant changes in the region in terms of development of infrastructure and also introduction of new crops in the area such as oil seed rape.

The BSPB conducted two successive winter season systematic field survey work (2009/10 and 2010/11) which focused on collecting data on foraging flocks distribution within the 15km boundary of Coastal Dobrudga allowing for an initial assessment on larger scale changes of the distribution of the foraging flocks of wintering geese and specifically the Red-breasted Goose. The surveys method consisted of visiting all potential feeding areas –cropfields with winter wheat or other suitable crop, within a perimeter of maximum of 15km around the roosting sites (Petkov et al. 2012).

Petkov et al. (2012) detected an "obvious shift in the distribution compared to the pre-construction period" (Figure 10a,b) and specified that "the most significant changes in the distribution of foraging flocks is observed in the area of Kavarna and Shabla municipalities, including the AES windfarm area".

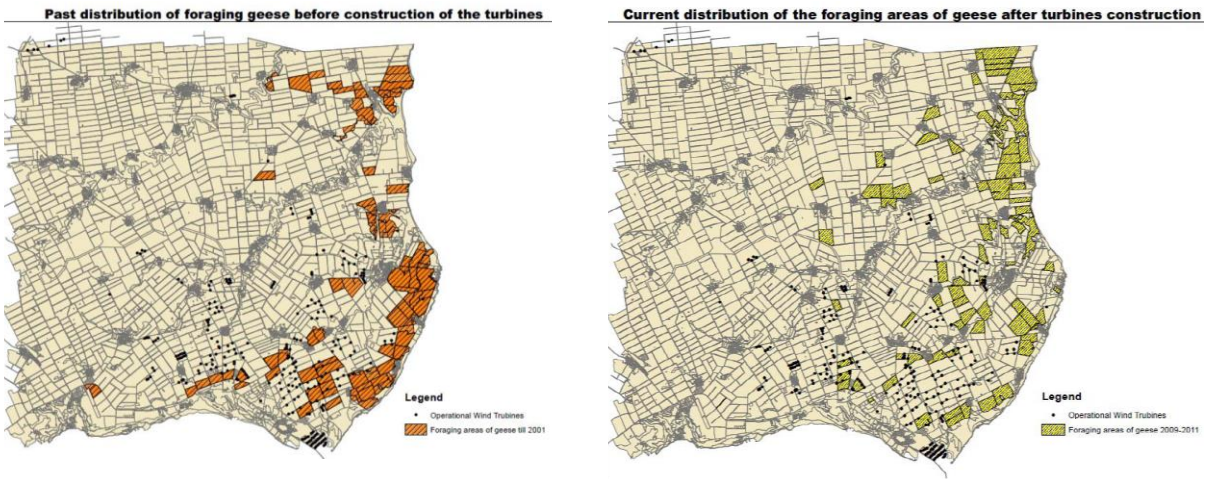

Figure 10. Distribution of the foraging flocks of wintering Red-breasted Goose and other geese species in Coastal Dobrudga with the wind turbines operating by august 2011: (a) in the winter period of 1998-99 and 1999-2000, based on data from Dereliev (2000) (left panel) and (b) in winter 2009-10 and 2010-11 (after Petkov et al. 2012)

Petkov et al. (2012) describe that they used data from Dereliev (2000) for the pre-construction period. As their map differs from the original map from Dereliev (2000) (compare Figure 8 and Figure 10a), the state that "[Dereliev (2000)] assigned as key/important fields those that regularly hold (at least 2 years during the study) flocks of over 1000 RBGs. Therefore some investors using this report and interpreting the data often refer to only those fields who have been assigned as key one. This could be very misleading and quite narrow interpretation of the data as "key" areas do not necessarily mean sufficient foraging areas." However, when carefully investigating the details of the survey of Dereliev (2000), it is not reproducible, how Petkov et al. (2012) come to Figure 9a from Deleriev (2000) data. There are several parcels in the wind farm area marked by Petkov as "foraging area of geese in the winter periods 1998/99 and 1999/2000", although they were empty in the corresponding maps of the winters 1998/99 and 1999/2000 (compare Figure 10a and Figure 11d,e), and also in the other winters investigated by Dereliev (2000), i.e. the winters 1995/96, 1996/97, and 1997/98 (compare Figure 10a and Figure 11a-c).

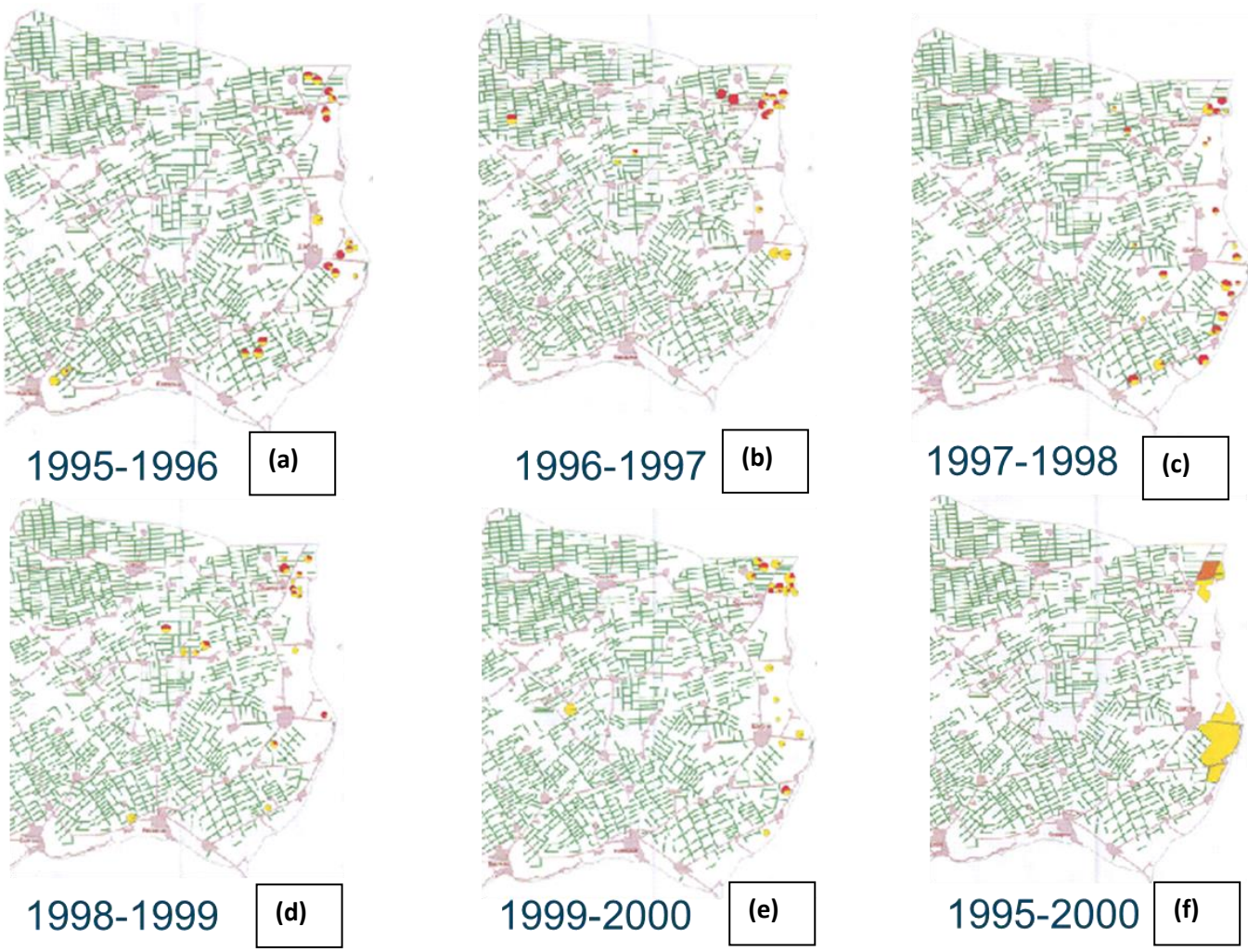

Figure 11. Distribution of Red-breasted geese (in red) according to Dereliev (2000) during winters (a) 1995/06, (b) 1996/97, (c) 1997/98, (d) 1998/99 , (e)1999/2000, and (f) overall, i.e. 1995-2000.

Illiev & Petkov (2015) collected data on wintering Red-breasted geese abundance in the Dobrudzha area during the seasons 2010 - 2014. Observations covered two permanent sites at Durankulak and Shabla Lake north from the municipality of Kavarna. The authors state, that "Red-breasted Goose has also been registered at the roost count points to the south of the lakes, but in lower numbers. The exception is in the winter of 2012-2013 when total of 15,220 Redbreasts were recorded at count point "Rusalka" [at the coast close to Sveti Nikola]. This is an exception and in most of the time the Redbreasts do not roost further south in large numbers as they used to do till early 2000s. The numbers in winter of 2010-2011 is just 211 birds." During mild winters, the majority of Red-breasted geese stays at Romania or even Ukraine (Stoeva 2014, Illiev & Petkov 2015). They only move along the shore to southern wetlands in high numbers under severe conditions. Freezing wetlands at roosts and snow cover over foraging sites are influential factors for abundance, as well. In most years, the numbers of Red-breasted geese south from Shabla Lake are very low and always limited to the hunting season, when geese avoid their preferred roosting sites at the lakes (Illiev & Petkov 2015). The average distance

from night roosts was 3 (0.7 - 9.3) km across all tagged individual, whereas Kavarna wind farms are more than 10 km apart. Hence, potential foraging habitats identified inside the Kaliakra wind farm area (winter wheat) are not part of the typical daily range of the wintering Red-breasted geese population roosting at Shabla and Durankulak Lakes. Wind farms at Kaliakra have no effect on arable areas in close vicinity to the lakes. Illiev & Petkov (2015) state that "Very few fixes were obtained from within or in close proximity to wind farms, despite ground-based observations of sometimes substantial numbers of geese feeding in fields within or close to wind farms or flying in or around such areas. The various studies undertaken under the LIFE project have confirmed that goose numbers and movements in Coastal Dobrudzha are highly variable both between and within seasons, thus the small number of catches, and the prevalence of data from February when birds appear to feed closer to the roosts, may explain the lack of fixes in areas further from roosts and with wind farms."

Zarkov (2014) conducted a well-designed study on abundance and flight height of wintering birds during the winters of 2012 and 2013 applying a Before-After-Control-Impact (BACI)-design. Zarkov (2014) detected low number of occurrences and high average flight height in the wind farm site "Bulgarevo" during 2013 when compared to 2012, whereas number of occurrences and flight height remained constant in the control site "Tyulenovo". Zarkov suggests that this patterns is caused by the wind park development between the before (2012) and the after (2013) situation. This can be feasible to some extent, not least because geese are known to be stringer affected by new infrastructure before habituation can take place, however, the high natural variability and the large number of other very relevant factors hampers the significance of these results.

Zehtindjiev et al. (2017) conducted a target-oriented investigation, methodologically based on a pre-construction study by Dereliev et al. (2000). Both studies covered the same area to allow for comparison of Red-breasted geese habitat utilization patterns over time. During post-construction, wind farms within and in close proximity to the study area, which also covered St Nikola wind farm, hosted a maximum of 146 operating wind turbines at a spacing of 300 to 600 m. Observations were performed daily between 1st of December and 31st of March during the winter seasons 2008 to 2014 from five vantage points in the wind farm periphery. Red-breasted geese foraging inside the wind farm area were observed separately to document the exact size of flocks. The authors aimed at identification of potential avoidance behavior of Red-breasted geese. It was found that the maximum number of Red-breasted geese feeding in that area did not differ significantly between the pre- and post-construction period of wind farms (Figure 12).

Zehtindjiev (2020) also compare habitat utilization of wintering Red-breasted geese from pre-construction period 1995 – 2000 and from 2008 - 2014 around St. Nikola wind farm (Figure 13). This comparison shows that the central part of the wind farm area has not been the core foraging habitat

of wintering Red-breasted geese during pre-construction. Nevertheless, Red-breasted geese foraging at cereal fields within 100 m to operating turbines were encountered.

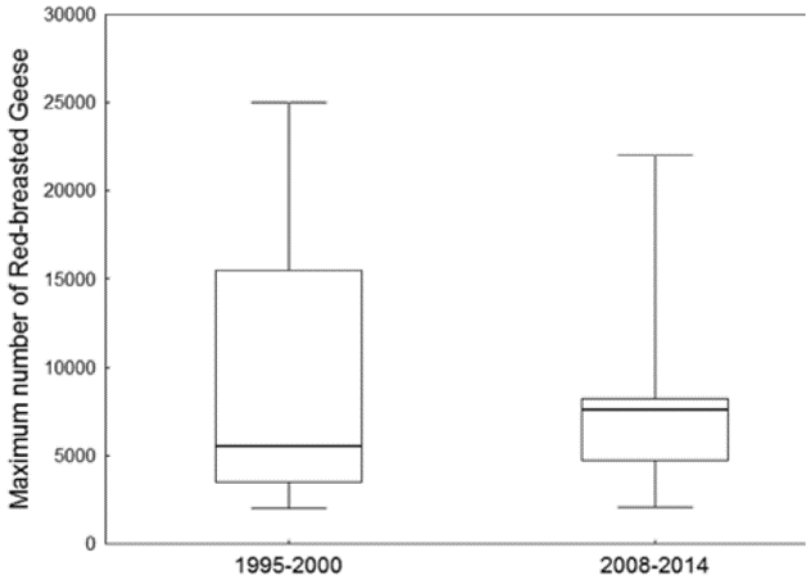

Figure 12. Maximum numbers of wintering Red-breasted geese foraging within the study area before and after construction of wind turbines (Zethindjiev et al. 2017).

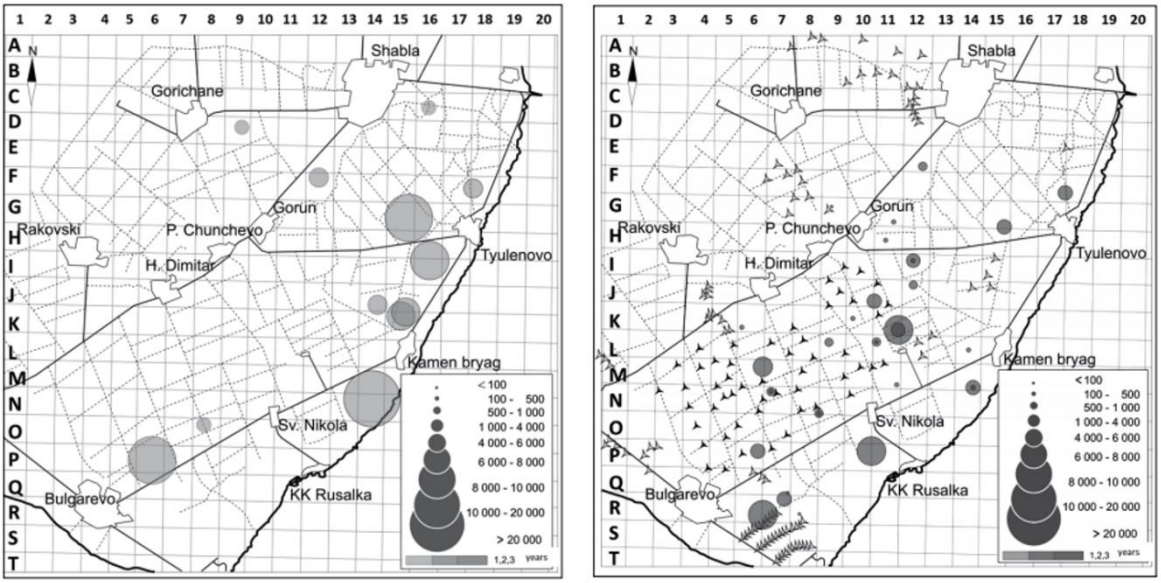

Figure 13. Habitat utilization of wintering Red-breasted geese (*Branta ruficollis*) from 1995 - 2000 (Dereliev et al. 2000) on the left and from 2008 - 2014 (Zehtindjiev et al. 2017) on the right. Solid lines = roads, dashed lines = shelter belts

Potential wind farm impacts on wintering geese have been mentioned by Harrison et al. (2018), a study also referred to by BSPB (Mateeva 2015). Statistical modelling by Harrison et al. (2018) produced indications of local and progressively reducing displacement effects within close proximity (< 100 m) to turbines. The models imply a stronger displacement effect on feeding geese by the two other

explanatory variables dealing with vertical structures (i.e. trees and power lines), compared to wind turbines. The map by Harrison et al. (2018) in Figure 14 indicates that the most important explanatory variable for local geese abundance is the distance to freshwater resources used as roosting sites.

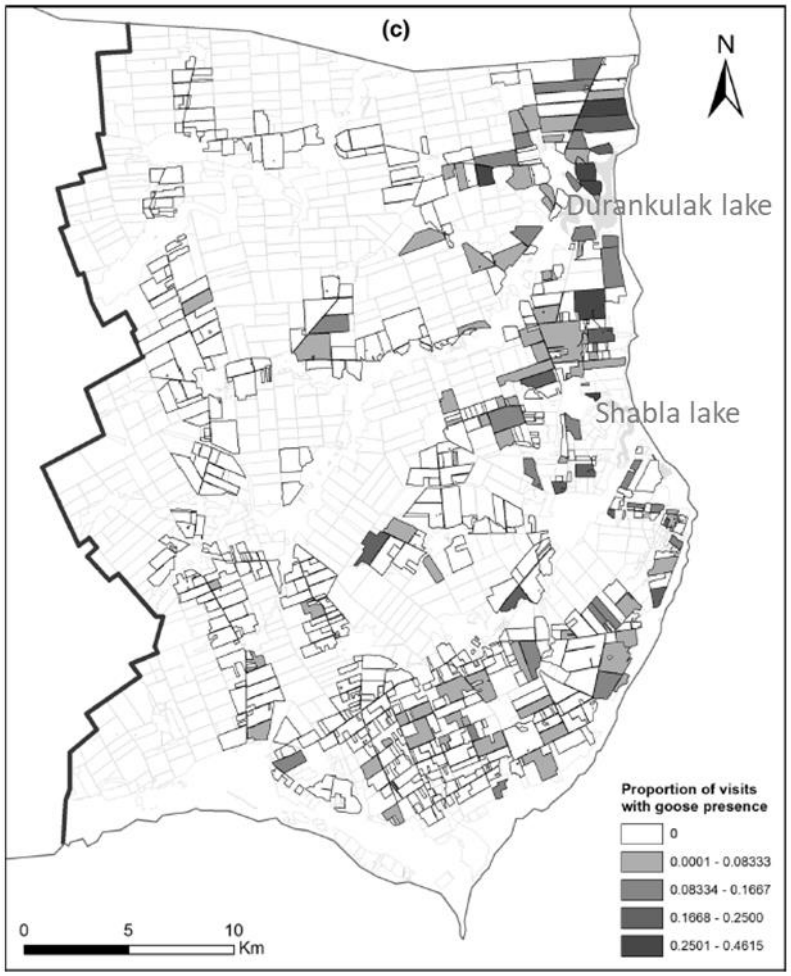

Figure 14. Abundance of goose species during wintering seasons 2011/12 and 2012/13 in the Kavarna region (Harrison et al. 2018)

The wide turbine spacing in St. Nikola wind farm is different from old-fashioned wind farm designs and seemingly allows for undisturbed flight passage from roosts to feeding grounds and utilization of winter cereal fields between the turbines but a low overall density of vertical structures. As investigations by Harrison et al. (2018) have shown, a detailed consideration of long-term changes in other landscape structures like power lines or shelter belts is necessary to understand habitat utilization of wintering geese.

Harrison et al. (2018) summarize their work in their abstract in the following way: "Habitat selection was scale-dependent. [Greater white-fronted *Anser albifrons* and red-breasted *Branta ruficollis*] Geese selected fields that were near to major roosts and had low proximity to roads and tree-lines, which may be a proxy for hunting disturbance. We found some evidence for selection of wheat fields with high nutritional quality. Within fields, geese strongly avoided features which cause landscape 'clutter':

power-lines, tree-lines and wind-turbines, but primarily over distances of less than a few hundred metres. Optimal management might involve encouraging goose populations to feed in areas close to roosts, by means of agri-environmental measures and creation of hunting-free refuges. This would allow efficient use of agri-environment funds, might reduce conflict with farmers, and would mean that infrastructure development —notably wind farms — could be sited at greater distance from roosts with relatively minor impact on foraging habitat availability. Thus, Harrison et al. (2018) clearly indicate that roosting sites, hunting and nutrition are the main triggers of geese distribution, with wind farms only being relevant "within field … primarily over distances of less than a few hundred metres" and that the principal solution solving even the conflicts with infrastructure development would be to "encouraging goose populations to feed in areas close to roosts by … creation of hunting-free refugia" (Harrison et al. (2018).

Applying the same data as Harrison et al. (2018) for further analysis, Harrison and Hilton (2014) mention in their "preliminary report" that "By excluding the influence of existing turbines (simulating a turbine-free landscape) we predict overall suitability of the landscape to be 6% higher [for geese]" and that further wind farm development might cause a large decrease of habitat suitability for geese.

Geese populations are seemingly not threatened by collisions with the wind farms in the Kaliakra area. Despite regular foraging activities of Red-breasted geese at winter cereal fields between local turbines (Zehtindjiev et al. 2017), not a single collision has been reported at Kavarna wind farms (Zehtindjiev 2020). Considering current knowledge on flight behavior and general collision mortality of geese species at wind farms and the absence of reported collisions at turbines of St. Nikola wind farm, significant increase of Red-breasted geese mortality, which would oppose conservational regulations at Kaliakra SPA is not indicated.

11.2.1.2. Geese and windfarms: Insights from international studies

According to Glutz von Blotzheim et al. (2001), wintering Red-breasted geese concentrate in strictly defined areas with safe overnight roosting sites, forage and freshwater resources proximity, avoiding large distance flights between foraging and roosting sites. Undisturbed roosting sites are almost exclusively available on open water. Hence, Red-breasted geese most commonly roost in the middle of lakes (Hulea 2002).

A long-term study on displacement effects on roosting geese species and habituation by Madsen & Boertmann (2008) at the Danish wind farms Klim Fjordholme (35 turbines), Vester Thorup (5 turbines) and Velling Maersk (66 turbines) showed, that the initial avoidance radius of 100 - 200m around turbines after construction halved from 1998 to 2008 due to habituation to 100m in the worst case. Moreover, avoidance was strongest at the beginning. After habituation, significant numbers of geese were observed foraging in distances 40 m away from turbines.

The Red-breasted Goose and other geese have been suspected to be threatened by turbine collision in the past (see Langston & Pullan 2004; Cranswick et al. 2012). More recent evaluations based on collision counts revealed, that geese are less prone to collision than other bird species. This might be because geese species habituate to threats at regularly frequented areas which prevents collisions (Douse 2013).

11.2.1.3. Displacement: summary

The relevant facts for the assessment of wind energy impacts on Red-breasted geese at Kaliakra SPA by displacement are the following:

Freshwater lakes in the north at Shabla and Durankulak are the preferred regional wintering habitat of Red-breasted geese. Geese roosting at the lakes mainly forage at the surrounding agricultural fields, representing the predominant land use type across Dobrudzha, including the Kavarna wind farm areas and the Kaliakra SPA. Consequently, no limiting habitat structures or scarce resources for wintering Red-breasted geese are present within the wind farm area. Winter cereal fields are still utilized by major flocks of geese, even though foraging sites of the same habitat quality and more distant to turbines would be available at agricultural fields in close proximity. The maximum numbers of Red-breasted geese foraging within the investigated wind farm area during the last decade do not reflect the negative trend of the European population of Red-breasted goose. There is no indication, that wind energy development at Kaliakra SPA has significant impact on either population trends or habitat utilization patterns of regionally wintering Red-breasted geese. On the contrary, the most influential factor is clearly hunting (Illiev & Petkov 2015), with geese being displaced in hunting days even into the Black Sea.

No collisions of Red-breasted geese with wind turbines have been reported in the whole region, despite targeted searches for carcasses after flocks passed the wind farm sites during the last decade. (see chapter 11.1). Turbine curtailment during the presence of target species is required to further minimize potential degradation of foraging habitats of Red-breasted geese.

Conservation efforts for Red-breasted geese should optimally focus on the lakes in the north, other wetlands of sufficient size along the Bulgarian Black Sea coast, and their surroundings. In particular the pressure due to hunting should be immediately reduced by the creation fo hunting free refugia and effects of this measure on space use by geese should be thoroughly monitored. Considering the study results of Harrison et al. (2018) and Madsen & Boertmann (2008) the displacement effect by wind turbines is too weak to affect the vitality of wintering geese populations and do not pose a significant threat to locally occurring Red-breasted geese. However, wind farm development close to the crucial roosts at Lakes Durankulak and Shable must be avoided at all costs.

Impact Assessment Displacement

Impact on birds:

Wintering Red-breasted geese at Kaliakra SPA are not significantly affected by the local wind energy projects, neither by collisions nor by displacement.

Reduction potential, e.g. through mitigation measures:

Turbine curtailment during the presence of target species further minimizes potential degradation of foraging habitats of Red-breasted geese. It is crucial that the main roosting areas close to Lakes Durankulak and Shabla will be kept free of wind farm development and that hunting free refugia will be installed for the geese.

11.2.2. Barrier effects

Barrier effects are disruptions of links between the different parts of a home ranges such as feeding, roosting or nesting areas (compare chapter 3). Barrier effects can theoretically occur without any spatial displacement, because birds might reach their usual centers of activity but have to make higher efforts to do so. However, barrier effects are only likely to be significant for clustered or very large projects, causing disruption of daily flight corridors, e.g. for breeding birds with high energy demands that cannot be compensated for. In the Kaliakra area, barrier effects are not indicated for breeding birds. Also for migrating birds, there is no evidence for significant barrier effects, because flight movements of large wind energy sensitive species flocks have been reported multiple times (e.g. white stork flocks of several 1000 individuals passed through SNWF at < 200m flight altitude).

New information about the existence of barrier effects for wintering geese became recently available applying specific analyses for ROBIN radar data (Интегриран план за управление [Integrated Management Plan], Zehtindjiev et al. in prep.). In this comprehensive study, it is mentioned that “there are no signs of a barrier effect in macro-geographical terms leading to the avoidance of the area of PA BG0002051 Kaliakra" [Не са установени признаци на бариерен ефект в макрогеографски план водещи до избягване на района на 33 BG0002051 „Калиакра“] and that the avoidance of hunting activities at the lakes in the North is a major factor influencing the direction and altitude of geese in this area. These results are thus in line with evidence presented above, indicating that in the Kaliakra area, hunting has clearly larger effects on disturbance and displacement of geese than wind turbines (compare chapter 11.2.1). According to the head of wind energy impact assessment at Kavarna wind farms, Prof. Dr. Zehtindjiev, the stated absence of any significant effects on the regionally wintering goose population is strongly supported by long term field observations and radar data. However, in the mentioned report (Интегриран план за управление [Integrated Management Plan], Zehtindjiev

et al. in prep.), radar data on spatial flight routes are only presented for a particular day with high density of bird movements.

The currently collected radar data are primarily utilized for mitigation of potential impacts like collision and are therefore unlikely to meet the requirements for systematic spatial analyses to gain information about barrier effects, not least, because this has never been the target of the radar applications. A serious challenge is for instance that flight movements of large flocks are not observed regularly during their wintering period. It can be thus suggested that attempts should be made to complement this single-day result presented in the Integrated Management Plan (Zehtindjiev et al. in prep.) with analyses of a few more days based on similar concerted efforts of radar and field observation teams.

Most importantly, the optimized field observation protocols provide a promising improvement of surveys to account for barrier effects (see Chapter 12) and gain further evidence on the likely absence of this effect.

11.2.3. Habitat loss

Habitat loss can affect breeding bird species when wind turbines are located in habitat of sensitive species. In the wind farms in the Kaliakra region, breeding birds have been surveyed by Zehtindjiev (2009, 2010a), Reichenbach et al. (2012), Zehtindjiev & Whitfield (2012c) and Karaivanov & Karaivanov (2019), however, a thorough study across the entire study area with Before-After-Control-Impact design has seemingly not been applied, although this would be necessary to clearly assess any impacts on breeding birds.

The study by Karaivanov & Karaivanov (2019) assessed the breeding bird populations at Kaliakra wind farm before construction (i.e. 2005) and after commissioning (i.e. 2009) along a 2,150 m transect covering 43 ha or roughly 10% of the Kaliakra wind farm, survey methodology being based on Bibby et al. (2000). The study lacks a thorough description of methods, consists of data from a single transect only (covered twice in both years) and it also lacks a comparative assessment sites from 2005 and 2009 out of the wind farm in order to allow for differentiation between population trends caused by the wind farm construction and operation and background population trends in the wider area.

However, the most abundant species, for which estimates of breeding pairs should by less prone to methodological uncertainties and stochasticity, clearly show a decline, e.g. when comparing the surveys in April 2005 and April 2009, relevant species such as Skylark *Alauda arvensis* declined by 84% (11.6 breeding pairs per hectare in 2005; 1.9 breeding pairs per hectare in 2009), Calandra lark *Melanocorypha calandra* by 22% (9.5 breeding pairs per hectare in 2005; 7.4 breeding pairs per hectare in 2009), and Greater short-toed lark *Calandrella brachydactyla* by 96% (5.4 breeding pairs per hectare in 2005; 0.2 breeding pairs per hectare in 2009). The data for May 2005 and 2009 are less reliable

(lower densities were detected, because a smaller share of birds is active), but also show declines for the most abundant species, the Calandra lark *Melanocorypha calandra* (Karaivanov & Karaivanov 2019).

It is mentioned by Zehtindjiev (2020) that wind power facilities should have positive effects on several species. Zehtindjiev (2020) also mention that the demand for turbine foundations, associated logistics and road network leaves a patchwork of flat embankments, gravel areas and tracks, extensively managed meadow strips and grassland at intensive agricultural fields (Zehtindjiev 2020). Indeed, in the study of Reichenbach et al. (2012) in the St. Nikola wind farm area, the following values are mentioned for the Calandra lark:

pre-construction 1996-2004: 0,43 breeding pairs / 10 ha;

post-construction 2009:

12.1 individuals per transect in wind farm area;

1.4 individuals per transect in control area with comparable habitat (intensive agriculture)

135.8 individuals per transect in steppe habitat

post-construction 2010:

19.5 individuals per transect in wind farm area

7.4 individuals per transect in control area with comparable habitat (intensive agriculture)

141.8 individuals per transect in steppe habitat

Reichenbach et al. (2012) conclude that (i) an increase occurred in numbers in the area of the wind farm after construction; (ii) wind farm areas have higher density than in adjacent agricultural areas, (iii) wind farms areas have significantly lower density than steppe area; (iv) habitat function of wind farm area not comparable to steppe area, and (v) that there is no negative effects of the St. Nikola wind farm on Calandra larks.

However, Reichenbach et al. (2012) do not present further information on their transects nor how measures “individuals per transect” and “breeding pairs / 10 ha) can be compared with each other. Positive effects due to wind power infrastructure can only occur in very particular settings such as in areas of very intensive agriculture where structures generated for operation of wind turbines might create habitat or perches for some particular species that occur at low densities. Densities of the steppe habitats are significantly higher and there wind farms have often negative impacts on breeding bird densities. Also in the areas dominated by intensive agriculture, there are patches of suitable breeding habitat for several relevant species, including Caladra lark, Great short-toed lark, Stone-curlew and raptors (BSPB 2010a). There is potential for the improvement of habitats in wind farm areas and thus to contribute to the conservation of relevant species.

The Kaliakra area hosts a relevant share of Bulgarian steppe habitats. There are shortcomings on the evidence of the status of breeding birds in these habitats. It must be recommended to conduct a robust survey in the wind farm areas for breeding birds, with a particular focus on the steppe habitats and shrublands. This survey should optimally be conducted in paired locations of similar habitats in windfarms and out of windfarms in order to assess densities and trends. It should be repeated and improved during the first three years and then be conducted in intervals of about three years, which should be enough to detect the most important trends.

Long-term programs to re-establish nature-orientated steppe-habitats at intensively managed agricultural sites under supervision of experienced biologists are recommended and should also be integrated into guidelines for land-scape management along the Bulgarian Black Sea coast. Implementation of conservation targets into agricultural management has great potential to reestablish important habitats of steppe species. Reduction of agricultural intensity and diversification of crops should be promoted facilitated by authorities.

11.3. Comparison oft he wind farms in Kaliakra with other European wind farms

The wind farms in the Kaliakra region can be compared to other European wind farms in the vicinity of important migration routes in terms of collision rates, mitigation measures, and monitoring and assessment efforts. Operating or currently commissioned wind energy projects are found within the range of other European migration corridors and sensitive bird areas such as in Southern Iberia, Sicily and the Baltic Sea (compare chapter 9).

Strong evidence for potentially significant impacts on avifauna has been collected at wind farms in Southern Iberia. Collision monitoring studies at Kavarna wind farms in 8 autumn migration seasons, resulted in a total of 4 raptor fatalities without application of correction factors. Collision mortality of target species is cleraly lower at Kavarna compared to Tarifa wind farms with implemented shut-down systems. In Sicily, the reported annual fatality rate (0 – 0.02 birds per turbine) does not seem to be reliable, because higher levels of collisions at wind farms are normally inevitable (Desholm 2006). Several Sicilian wind farms appear to bear the potential of impacts on avifauna to at least the same degree as wind farms in the Kavarna region. However, the commissioning of new, large wind energy facilities at Sicily is currently on its way, even though knowledge on potential impacts and risk zones on the island is patchy when compared to the Kavarna region. Collision risk estimates reported for Kriegers Flak Wind Farm site in the Baltic Sea are based on pre-construction Band model (Band et al. 2012) calculations, which do not provide an assessment basis as solid as post-construction collision monitoring such as the one conducted at Kavarna

Wind farm operators at Tarifa and Sagres have implemented mitigation measures to prevent collision of vulnerable soaring birds, mainly vultures and other large raptor species. Turbine shutdown systems reduced collision risk in Tarifa and even more efficiently in Sagres, where field ornithologists are assisted by radar units. The experiences made by Tomé et al. (2017) and a direct comparison of turbine shutdown systems effectivity in Tarifa and Sagres argue in favor of radar assistance into the turbine shutdown systems at Kavarna wind farms, which is an appropriate method to overcome limitations of turbine shutdown systems regulated via visual observations. On the other hand, radar investigations at the Strait of Messina revealed that migrating birds and specifically large soaring birds, avoid flying through low clouds or fog (Panuccio et al. 2019). Hence, migration traffic estimation and turbine shutdown systems based on visual observations appear to be reliable methodological approaches. Across project examples, efficiency of turbine shutdown systems could generally be optimized due to increasing experience of operating staff and constant improvement of shutdown protocols. Thus, radar observations can effectively assist turbine shutdown systems operators and are an appropriate technology to overcome limitations of visual detection and avoid potential risk situations during periods of poor visibility. According to a recently published review by KNE (2020), shut-down of current turbine types is possible within 20 – 30 sec after a risk situation has been detected. Within this time-span the rotor blades are pitched downwind and spinning is phased out into a mode of insignificant collision risk.

Commissioning of wind energy projects at sensitive sites bears a residual risk despite state-of-the-art Environmental Impact Assessment. Deeper knowledge of wind energy impacts can be obtained from long-term investigations as conducted at Kavarna wind farms. Not feasible collision rates in Sicily might be related to a lack of consistence with basic standards for research and monitoring during the collision monitoring in 2013 and 2014. It should be pointed out that collision monitoring at Kavarna wind farms had been conducted simultaneously at Saint Nikola Wind Farm (see Zehtindjiev & Withfield 2013 for direct comparison) and in 2015 at EVN Wind Farm (Traxler et al. 2020) and that it was conducted in compliance with higher scientific standards. A critical review of Kriegers Flak Wind Farm site impact assessment reveals that in member states like Germany, Denmark or Sweden, authorities with leading expertise in wind energy development accept a considerable residual risk when commissioning wind energy projects. It could be argued, that at worst the whole biogeographic population of Common Cranes could be indirectly affected by Kriegers Flak Wind Farm site. Similar indirect effects on Red-breasted geese and White storks foraging and resting in proximity to wind farms have been controversially discussed between stakeholders of the Kavarna case and clear evidence for potential significance of such effects has not been provided. At offshore projects such as Kriegers Flak Wind Farm site, post-construction assessment of collision mortality to confirm the predictions is clearly highly challenging. Ornithological knowledge at Kavarna is more comprehensive and therefor allows

more solid assessment of collision risk and other impact types. The residual risk of underestimating impacts is considerably higher at Kriegers Flak Wind Farm site compared to Kavarna wind farms.

Concluding, the current mitigation measures at the wind farms in the Kaliakra area, i.e. Integrated Bird Protection System consisting of a turbine shut down system and a comprehensive monitoring (compare chapter 7.2), matches with good practice in Europe, because it combines collision monitoring, visual observations and radar systems and a turbine shutdown system. Furthermore, it is particularly positive that the Integrated Bird Protection System is implemented jointly by several wind farm operators and that comprehensibility and transparency are considered. When comparing collision rates, it can be stated that collisions in the Kaliakra area are clearly lower than in Southern Iberia and also than modelled estimates for the Baltic Sea (in Sicily, collision rates are even lower than in Kaliakra, but data do not seem to be feasible). This is demonstrating the efficiency of mitigating and reducing bird deaths as a result of collisions in the Kaliakra wind farms, but is to a large extent also because the Via pontica migration concentrates in the west of Kaliakra SPA and is much lower than migration concentrations in Tarifa.

12. Recommendations to improve impact monitoring and mitigation

12.1. Homogeneity of the dataset

Long-term observations at Kaliakra wind farms can improve the illustration of seasonal and annual patterns of flight and habitat utilization patterns, if data are collected following recommended standardized protocols. A first step to further improve homogeneity of the datasets is the revision of vantage point IDs. There are multiple cases of similar coordinates applying to different vantage point IDs. It is recommended to create a central database of georeferenced vantage points with standardized IDs and ensure accessibility by field ornithologists. In this way, the set of standard vantage points in the Kaliakra area should be reduced to a minimum, while still covering the area of interest. Simultaneously, comprehensive analysis of habitat utilization and flight movement patterns is facilitated, as for long-term analyses the total number of observation hours at each vantage point will increase substantially without producing inconsistent data.

For each observation event the exact time of beginning and ending should be separately noted for the different vantage points. This is necessary to acquire comparable data on space use patterns in an occurrence-per-time unit format. Moreover, each observation session should be subdivided into intervals of 15 minutes. Each specimen present during an interval results in one count of the target species, independent from the duration of presence. This concept offers the opportunity for more detailed comparative analysis of space use.

12.2. Spatial range of observations

Currently, each observation within a 3,000 m radius around vantage points is entered in the datasheet, which is appropriate for the early warning system. Identification of species by human observers significantly declines at a distance of 2,000 m (SNH 2013). For that reason, standardized protocols typically exclude observations from >1,000 m distance. By adding an additional column in the datasheet, observations within and outside a 1,000 m standard circle will be separated to improve specific further analysis.

12.3. Weather conditions

The only climate parameter assessed in the current protocol is cloudiness, which is mainly used as a proxy for visual detectability and sight radius of observers. This could be done more precisely by a direct evaluation of visibility. Also, integration of the parameters temperature, wind speed and direction can be filled into the field protocol once for each monitoring session without additional effort. For identification of secondary influence factors on bird species behaviour, these parameters are highly valuable and can be used to separate wind energy impacts from abiotic environmental effects.

12.4. Overview on field work effort per vantage point

For further analyses of species temporal and spatial utilization at observed sites, also a documentation of total observation hours spent per day and vantage point is necessary. For this purpose, a third data sheet should be attached to the documentation form including the following parameter columns in the given format:

date (mm/dd/yyyy), vantage point ID, start of observation (hh:mm), end of observation (hh:mm); observer (name)

This information should also be made available for the past from observers geotracking data.

12.5. Monitoring of breeding birds

The Kaliakra area hosts a relevant share of Bulgarian steppe habitats. There are shortcomings on the evidence of the status of breeding birds in these habitats. It must be recommended to conduct a robust survey in the wind farm areas for breeding birds, with a particular focus on the steppe habitats and shrublands. This survey should optimally be conducted in paired locations of similar habitats in windfarms and out of windfarms in order to assess densities and trends. It should be repeated and improved during the first three years and then be conducted in intervals of about three years, which should be enough to detect the most important trends.

12.6. Optional efforts for potential target species

In very rare events single breeding individuals (eg. special large breeding birds, mainly endangered raptors) can be identified by visible plumage features (eg. results of shooting). Under this rare circumstances it is helpful to record this individual features and additionally age, sex or other individual characteristics. This method can facilitate investigation of potential disturbance effects on local breeding birds. Nevertheless, practical application of the method is difficult and will work out in extremely rare cases.

Mapping of flight movements on 1:25,000 maps might be useful to investigate specific research questions on target species (c.f. Poirazidis et al. 2009). However, even for experienced ornithologists, this methods require the observers full attention and should not compromise the effectiveness of the early warning system. Hence, mapping of flight movements should be strictly limited to sensitive target species of specific local conservation concern.

12.7. Overview of parameters

Relevant paremeters are summarized in Table 9.

Table 9. Parameters for monitoring protocols. Currently collected parameters are marked green, while additionally recommended parameters are marked red.

Parameters	unit	Protocol currently used by ornithologists
Parameters for an entire monitoring session		
observer	name	yes
date	mm/dd/yyyy	yes
time (start / end)	hh:mm	
coordinated of the vantage point	xx,yy	
weather conditions		
temperature	°C	
cloudiness	%	yes
wind speed	Beaufort	
wind direction	16-wind compass rose	
visibility	3 categories	
further comments,	e.g. particular migration events, disturbances or interruption of the monitoring	
Parameters for observed specimen		
time	hh:mm	yes
counts	counts per interval	
location	xx,yy	yes, with x- and y-coordinates
species	abbrev.	yes

number of individuals	counts	yes (flock size)
age & sex (if feasible)	juv/prem/ad & f/m	
minimum distance from vantage point to bird	m	yes
minimum distance from vantage point to bird > 1000m	yes/no	
direction from vantage point or transect to detected bird	8-wind compass rose	yes
behavior	active flight, soaring, resting, territorial behavior…	yes
flight altitude	m	yes
flight direction	16-wind compass rose	yes
flight route	See map	

All these parameters should be standardized and described in detail according to the monitoring protocol in a second sheet, attached to the data form to facilitate a standardized documentation by different observers and to allow independent but scientifically sound interpretation of the data by extern analysts. Field ornithologists should be explicitly instructed to fill in the data form recalling the detailed description of parameters. Senior ornithologists should check for completeness of protocols at a random basis to ensure a constant quality of data.

12.8. Transparency, data availability, and stakeholder involvement

It must be highly recommended that raw data get published with all kind of studies and assessments. Inaccurate and non-transparent documentation of results and methods complicate secondary analyses and impact assessment, and lead to complications among stakeholders. Thus, it must be strongly recommended that monitoring is undertaken in conjunction with research by NGOs, supported by data-sharing agreements.

13. Conclusions

The investigations in relation to the wind farms in the study area provided a great amount of information on for different species of birds in the area. The region of Kaliakra is a sensitive area for birds. Although not in the absolute core of the migration route Pontic Flyway, it hosts a diverse and abundant community of sensitive migrating birds, breeding birds, and wintering birds. The collected data provided strong evidence

Due to the low number of collision victims found below turbines at St. Nikola wind farm (autumn, winter) and EVN wind farm (autumn), a significant increase of avian mortality at Kaliakra SPA due to local wind energy projects is not indicated. This is especially true for target species of special conservation concern at Kaliakra SPA. Autumn migration at Kaliakra SPA is not significantly affected by

the local wind energy projects. Mass collision events occurred in other wind farms under very particular circumstances. Their potential future occurrence in the wind farms of the Kaliakra must be mitigated by appropriate mitigation measures. Thus, turbine curtailment during the presence of target species is required to minimizes the risk for letal collisions of migrating, wintering or breeding target species. The low collision mortality at Kaliakra SPA wind turbines suggests a high efficiency of turbine curtailment in response to potential risk situations.

Displacement is a minor issue at the wind farms in the Kaliakra area and wintering Red-breasted geese at Kaliakra SPA are not significantly affected by the local wind energy projects, neither by collisions nor by displacement. Turbine curtailment during the presence of target species further minimizes potential degradation of foraging habitats of Red-breasted geese.

The Kaliakra area hosts a relevant share of Bulgarian steppe habitats. There are shortcomings on the evidence of the status of breeding birds in these habitats. It must be recommended to conduct a robust survey in the wind farm areas for breeding birds, with a particular focus on the steppe habitats and shrublands. This survey should optimally be conducted in paired locations of similar habitats in windfarms and out of windfarms in order to assess densities and trends. It should be repeated and improved during the first three years and then be conducted in intervals of about three years, which should be enough to detect the most important trends.

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ANNEX

List of Bulgarian SCIs including BG0000573 Kompleks Kaliakra.

SITE CODE	SITE NAME	SITE TYPE	DATE COMPI-LATION	DATE UP-DATE	DATE PROP SCI	DATE CONF SCI	EXPLANATIONS	AREA HA	MARINE_ AREA_ %
BG0000573	**Kompleks Kaliakra**	**B**	**01.04. 2006**	**01.12. 2018**	**01.12. 2007**	**01.12. 2008**	**Adopted by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Modified in the marine part by Council of Ministers Decision No. 660/01.11.2013 (promulgated SG 97/2013). Extended terrestrial part by Council of Ministers Decision No. 223/24.04.2014 (promulgated SG 37/2014). Issued by the Minister of Environment and Water designation Order No. RD – 815/12.12.2017 (promulgated SG 100/2017) with prohibitions and restrictions on activities contradicting the conservation objectives of the site.**	**48336,28**	**90,5**
BG0000100	Plazh Shkorpilovtsi	B	01.12. 2003	01.12. 2018	01.12. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	5125,65	21,8
BG0000102	Dolinata na reka Batova	B	01.12. 2003	01.12. 2018	01.12. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	18459,24	0
BG0000103	Galata	B	01.11. 2003	01.12. 2018	01.12. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Modified in the marine part by Council of Ministers Decision No. 660/01.11.2013 (promulgated SG 97/2013).	1842,97	79
BG0000104	Provadiysko - Royaksko plato	B	01.12. 2003	01.12. 2018	01.10. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007).	50158,59	0
BG0000106	Harsovska reka	B	01.01. 2004	01.12. 2018	01.10. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007).	36756,7	0
BG0000107	Suha reka	B	01.01. 2004	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	62528,73	0
BG0000116	Kamchia	B	01.12. 2003	01.12. 2018	01.12. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	12919,94	5,8
BG0000117	Kotlenska planina	B	01.01. 2004	01.12. 2018	01.10. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007).	69058,92	0
BG0000118	Zlatni pyasatsi	B	01.11. 2003	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	1374,44	0
BG0000119	Trite bratya	B	01.01. 2004	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	1021,99	0
BG0000130	Kraymorska Dobrudzha	B	01.11. 2003	01.02. 2019	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Modified by Council of Ministers Decision No. 223/24.04.2014 (promulgated SG 37/2014).Issued by the Minister of Environment and Water designation Order No. RD – 793/20.12.2018 (promulgated SG 10/2019) with prohibitions and restrictions on activities contradicting the conservation objectives of the site.	6657,7	0
BG0000132	Pobitite kamani	B	01.11. 2003	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	231,35	0
BG0000133	Kamchiyska i Emenska planina	B	01.01. 2004	01.12. 2018	01.10. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007).	63678,47	0
BG0000134	Choklyovo blato	B	01.12. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	280,86	0
BG0000136	Reka Gorna Luda Kamchia	B	01.01. 2004	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	2276,93	0
BG0000137	Reka Dolna Luda Kamchia	B	01.01. 2004	01.12. 2018	01.12. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	2460,7	0
BG0000138	Kamenitsa	B	01.01. 2004	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	1455,71	0
BG0000139	Luda Kamchia	B	01.12. 2003	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	6111,06	0

BG0000141	Reka Kamchia	B	01.10.2005	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	158,84	0
BG0000143	Karaagach	B	01.01.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	64,16	0
BG0000146	Plazh Gradina - Zlatna ribka	B	01.01.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Extended by Council of Ministers Decision No. 660/01.11.2013 (promulgated SG 97/2013), including the area of SCI BG0000110 „Ostrovi Sv. Ivan i Sv. Petar" deleted by the same Decision.	1245,85	82,95
BG0000149	Rishki prohod	B	01.01.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	11861,5	0
BG0000151	Aytoska planina	B	01.01.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	29379,4	0
BG0000154	Ezero Durankulak	B	01.10.2003	01.12.2018	01.12.2007	01.12.2008	Adopted by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	5050,79	74,5
BG0000164	Sinite kamani	B	01.12.2003	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	12288,91	0
BG0000165	Lozenska planina	B	01.10.2005	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	1294,42	0
BG0000166	Vrachanski Balkan	B	01.09.2003	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	35981,25	0
BG0000167	Belasitsa	B	01.07.2006	01.12.2018	01.10.2007	01.12.2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007).	11587,77	0
BG0000168	Ludogorie	B	01.06.2004	01.12.2018	01.10.2007	01.12.2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007).	59447,46	0
BG0000169	Ludogorie - Srebarna	B	01.06.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	5223,8	0
BG0000171	Ludogorie - Boblata	B	01.09.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	4836,45	0
BG0000173	Ostrovche	B	01.06.2004	01.12.2018	01.10.2007	01.12.2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007).	6749,19	0
BG0000178	Ticha	B	01.09.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	2706,93	0
BG0000180	Boblata	B	01.09.2005	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	3216,87	0
BG0000181	Reka Vit	B	01.08.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	5717,17	0
BG0000182	Orsoya	B	01.12.2005	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Extended by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	2949,41	0
BG0000190	Vitata stena	B	01.08.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	2630,19	0
BG0000192	Reka Tundzha 1	B	01.10.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Extended by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	9503	0
BG0000194	Reka Chaya	B	01.06.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	650,62	0
BG0000195	Reka Tundzha 2	B	01.10.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	5953,32	0
BG0000196	Reka Mochuritsa	B	01.06.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Extended by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	8702,83	0
BG0000198	Sredetska reka	B	01.09.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	707,78	0
BG0000199	Tsibar	B	01.12.2005	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	2971,73	0
BG0000203	Tulovo	B	01.06.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	161,71	0
BG0000205	Straldzha	B	01.06.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	882,02	0
BG0000206	Sadievo	B	01.09.2006	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	516,67	0

BG0000208	Bosna	B	01.09.2004	01.12.2018	01.10.2007	01.12.2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007).	16225,89	0
BG0000211	Tvardishka planina	B	01.10.2004	01.12.2018	01.10.2007	01.12.2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007).	38649,53	0
BG0000212	Sakar	B	01.06.2004	01.12.2018	01.10.2007	01.12.2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007).	132117,76	0
BG0000213	Tarnovski visochini	B	01.07.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	4434,61	0
BG0000214	Dryanovski manastir	B	01.07.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	2987,89	0
BG0000216	Emen	B	01.12.2003	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	490,37	0
BG0000217	Zhdreloto na reka Tundzha	B	01.06.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	7856,99	0
BG0000218	Derventski vazvishenia 1	B	01.06.2004	01.12.2018	01.12.2007	01.12.2008	Adopted by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	38696,5	0
BG0000219	Derventski vazvishenia 2	B	01.10.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	55036,13	0
BG0000220	Dolna Mesta	B	01.03.2006	01.12.2018	01.12.2007	01.12.2008	Adopted by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	9514,7	0
BG0000224	Ograzhden - Maleshevo	B	01.03.2006	01.12.2018	01.10.2007	01.12.2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007).	27373,5	0
BG0000230	Fakiyska reka	B	01.07.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	4104,72	0
BG0000231	Belenska gora	B	01.07.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	5041,85	0
BG0000232	Batin	B	01.07.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	2691,05	0
BG0000233	Studena reka	B	01.07.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	5301,57	0
BG0000239	Obnova - Karaman dol	B	01.07.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	10750,81	0
BG0000247	Nikopolsko plato	B	01.07.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	18503,18	0
BG0000254	Besaparski vazvishenia	B	01.08.2005	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	6743,06	0
BG0000255	Gradinska gora	B	01.06.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	439,9	0
BG0000261	Yazovir Koprinka	B	01.06.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	876,33	0
BG0000263	Skalsko	B	01.09.2005	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	2189,47	0
BG0000266	Peshtera Mandrata	B	01.05.2004	01.09.2016	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Amended by Council of Ministers Decision No. 598/22.07.2016 (promulgated SG 59/2016), including the area of SCI BG0000607 deleted with the same Decision.	1,82	0
BG0000269	Peshtera Lyastovitsata	B	01.07.2004	01.07.2015	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued by the Minister of Environment and Water designation Order No. RD – 103/09.02.2015 (promulgated SG 17/2015) with prohibitions and restrictions on activities contradicting the conservation objectives of the site.	0,51	0
BG0000275	Yazovir Stamboliyski	B	01.08.2004	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	9355,55	0
BG0000279	Stara reka	B	01.12.2005	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	146,17	0
BG0000280	Zlatarishka reka	B	01.12.2005	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	67,69	0
BG0000281	Reka Belitsa	B	01.12.2005	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	117,26	0

BG0000282	Dryanovska reka	B	01.12. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	183,16	0
BG0000287	Merichlerska reka	B	01.01. 2006	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	509,9	0
BG0000289	Trilistnik	B	01.08. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	616,95	0
BG0000291	Gora Shishmantsi	B	01.08. 2005	01.07. 2015	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	373,99	0
BG0000294	Karshalevo	B	01.04. 2006	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	6307,08	0
BG0000295	Dolni Koriten	B	01.08. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	461,69	0
BG0000298	Konyavska planina	B	01.09. 2006	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	9671,95	0
BG0000301	Cherni rid	B	01.09. 2006	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	858,45	0
BG0000304	Golak	B	01.08. 2005	01.12. 2018	01.10. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007).	10930,51	0
BG0000308	Verila	B	01.09. 2006	01.12. 2018	01.10. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007).	6443,42	0
BG0000313	Ruy	B	01.08. 2006	01.12. 2018	01.10. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007). Extended by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	6236,21	0
BG0000314	Rebro	B	01.09. 2006	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	213,39	0
BG0000322	Dragoman	B	01.07. 2006	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	21357,18	0
BG0000334	Ostrov	B	01.09. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Extended by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	3918,6	0
BG0000335	Karaboaz	B	01.09. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Extended by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	13659,86	0
BG0000336	Zlatia	B	01.09. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	3194,78	0
BG0000339	Rabrovo	B	01.07. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	910,82	0
BG0000340	Tsar Petrovo	B	01.09. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Extended by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	1908,74	0
BG0000365	Ovchi halmove	B	01.11. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	1309,66	0
BG0000366	Kresna - Ilindentsi	B	01.03. 2006	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Extended by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	48596,43	0
BG0000372	Tsigansko gradishte	B	01.09. 2006	01.12. 2018	01.10. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007).	9555,74	0
BG0000374	Bebresh	B	01.02. 2006	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	6821,91	0
BG0000377	Kalimok - Brashlen	B	01.10. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	7550,18	0
BG0000382	Shumensko plato	B	01.10. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	4490,62	0
BG0000393	Ekokoridor Kamchia - Emine	B	01.11. 2005	01.12. 2018	01.10. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007).	28054,79	0
BG0000396	Persina	B	01.12. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Extended by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	25684,2	0
BG0000401	Sveti Iliyski vazvishenia	B	01.10. 2004	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	8464,27	0

BG0000402	Bakadzhitsite	B	01.09. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	4504,87	0
BG0000418	Kermenski vazvishenia	B	01.11. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Extended by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	2107,81	0
BG0000420	Grebenets	B	01.12. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	9884,53	0
BG0000421	Preslavska planina	B	01.08. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	14060,01	0
BG0000424	Reka Vacha - Trakia	B	01.09. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	550,32	0
BG0000425	Reka Sazliyka	B	01.09. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	991,77	0
BG0000426	Reka Luda Yana	B	01.09. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	474,08	0
BG0000427	Reka Ovcharitsa	B	01.12. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	1163,72	0
BG0000429	Reka Stryama	B	01.05. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	4078,38	0
BG0000432	Golyama reka	B	01.12. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	7451,74	0
BG0000434	Banska reka	B	01.12. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	77,3	0
BG0000435	Reka Kayaliyka	B	01.12. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	71,4	0
BG0000436	Reka Mechka	B	01.12. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	3310,7	0
BG0000437	Reka Cherkezitsa	B	01.12. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	144,75	0
BG0000438	Reka Chinardere	B	01.12. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	1155,56	0
BG0000440	Reka Sokolitsa	B	01.07. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	141,54	0
BG0000441	Reka Blatnitsa	B	01.07. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	1079,1	0
BG0000442	Reka Martinka	B	01.12. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	722,68	0
BG0000443	Reka Omurovska	B	01.08. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	532,31	0
BG0000444	Reka Pyasachnik	B	01.01. 2006	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	1879,97	0
BG0000487	Bozhite mostove	B	01.09. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	33,12	0
BG0000497	Archar	B	01.12. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Extended by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	808,65	0
BG0000498	Vidbol	B	01.07. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	1305,14	0
BG0000500	Voynitsa	B	01.07. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Extended by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	3107,14	0
BG0000501	Golyama Kamchia	B	01.08. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	216,69	0
BG0000503	Reka Lom	B	01.11. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	1441,13	0
BG0000507	Deleyna	B	01.07. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	2257,54	0
BG0000508	Reka Skat	B	01.11. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	408,59	0

BG0000509	Tsibritsa	B	01.11. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	962,68	0
BG0000513	Voynishki Bakadzhik	B	01.10. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	1138,94	0
BG0000516	Chernata mogila	B	01.08. 2006	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	13,07	0
BG0000517	Portitovtsi - Vladimirovo	B	01.11. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	664,38	0
BG0000518	Vartopski dol	B	01.11. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	987,42	0
BG0000519	Mominbrodsko blato	B	01.11. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	26,61	0
BG0000521	Makresh	B	01.07. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	2061,25	0
BG0000522	Vidinski park	B	01.07. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	1578,79	0
BG0000523	Shishentsi	B	01.07. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	572,85	0
BG0000524	Orizishteto	B	01.07. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	475,74	0
BG0000525	Timok	B	01.07. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	494,97	0
BG0000526	Dolno Linevo	B	01.12. 2005	01.09. 2016	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Amended by Council of Ministers Decision No. 598/22.07.2016 (promulgated SG 59/2016).	17,63	0
BG0000527	Kozloduy	B	01.12. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	125,38	0
BG0000528	Ostrovska step - Vadin	B	01.12. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	301,29	0
BG0000529	Marten - Ryahovo	B	01.12. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	1172,74	0
BG0000530	Pozharevo - Garvan	B	01.06. 2004	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Extended by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	6304,92	0
BG0000532	Ostrov Bliznatsi	B	01.12. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Extended by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	606,25	0
BG0000533	Ostrovi Kozloduy	B	01.12. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Extended by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	909,04	0
BG0000534	Ostrov Chayka	B	01.12. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Extended by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	504,17	0
BG0000539	Gora Topolyane	B	01.12. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	67,55	0
BG0000552	Ostrov Kutovo	B	01.12. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued by the Minister of Environment and Water designation Order No. RD – 239/16.04.2015 (promulgated SG 39/2015) with prohibitions and restrictions on activities contradicting the conservation objectives of the site.	118,33	0
BG0000553	Gora Topolchane	B	01.12. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	66,58	0
BG0000554	Gora Zhelyu Voyvoda	B	01.12. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	71,99	0
BG0000567	Gora Blatets	B	01.02. 2006	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	47,85	0
BG0000569	Kardam	B	01.12. 2003	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	918,92	0
BG0000570	Izvorovo - Kraishte	B	01.12. 2003	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	1082,27	0
BG0000572	Rositsa - Loznitsa	B	01.12. 2003	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	1811,98	0

BG0000573	Kompleks Kaliakra	B	01.04. 2006	01.12. 2018	01.12. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Modified in the marine part by Council of Ministers Decision No. 660/01.11.2013 (promulgated SG 97/2013). Extended terrestrial part by Council of Ministers Decision No. 223/24.04.2014 (promulgated SG 37/2014). Issued by the Minister of Environment and Water designation Order No. RD – 815/12.12.2017 (promulgated SG 100/2017) with prohibitions and restrictions on activities contradicting the conservation objectives of the site.	48336,28	90,5
BG0000574	Aheloy - Ravda - Nesebar	B	01.04. 2006	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued by the Minister of Environment and Water designation Order No. RD – 400/12.07.2016 (promulgated SG 58/2016) with prohibitions and restrictions on activities contradicting the conservation objectives of the site.	3926,78	81,1
BG0000576	Svishtovska gora	B	01.10. 2006	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	1917,2	0
BG0000578	Reka Maritsa	B	01.12. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	14693,1	0
BG0000587	Varkan	B	01.10. 2006	01.07. 2015	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued by the Minister of Environment and Water designation Order No. RD – 102/09.02.2015 (promulgated SG 17/2015) with prohibitions and restrictions on activities contradicting the conservation objectives of the site.	0,69	0
BG0000589	Marina dupka	B	01.10. 2006	01.07. 2015	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued by the Minister of Environment and Water designation Order No. RD – 100/09.02.2015 (promulgated SG 17/2015) with prohibitions and restrictions on activities contradicting the conservation objectives of the site.	2,66	0
BG0000591	Sedlarkata	B	01.10. 2006	01.07. 2015	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued by the Minister of Environment and Water designation Order No. RD – 104/09.02.2015 (promulgated SG 17/2015) with prohibitions and restrictions on activities contradicting the conservation objectives of the site.	0,8	0
BG0000593	Bilernitsite	B	01.10. 2006	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	64,51	0
BG0000594	Bozhia most - Ponora	B	01.10. 2006	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	227,9	0
BG0000601	Kalenska peshtera	B	01.10. 2006	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	377,38	0
BG0000602	Kabiyuk	B	01.10. 2006	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	286,87	0
BG0000605	Bozhkova dupka	B	01.10. 2006	01.07. 2015	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued by the Minister of Environment and Water designation Order No. RD – 101/09.02.2015 (promulgated SG 17/2015) with prohibitions and restrictions on activities contradicting the conservation objectives of the site.	1,6	0
BG0000608	Lomovete	B	01.01. 2004	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	32488,93	0
BG0000609	Reka Rositsa	B	01.08. 2004	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	1440,86	0
BG0000610	Reka Yantra	B	01.07. 2004	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Issued by the Minister of Environment and Water designation Order No. RD – 401/12.07.2016 (promulgated SG 62/2016 and SG 63/2016) with prohibitions and restrictions on activities contradicting the conservation objectives of the site.	13899,88	0
BG0000611	Yazovir Gorni Dabnik	B	01.09. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	2539,29	0
BG0000612	Reka Blyagornitsa	B	01.07. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	1522,94	0
BG0000613	Reka Iskar	B	01.11. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	9458	0
BG0000614	Reka Ogosta	B	01.11. 2005	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Extended by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	1365,74	0
BG0000615	Devetashko plato	B	01.08. 2004	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	14997,07	0
BG0000616	Mikre	B	01.06. 2004	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	15447,16	0
BG0000617	Reka Palakaria	B	01.09. 2006	01.12. 2018	01.12. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	3006,73	0
BG0000618	Vidima	B	01.09. 2006	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	1823,05	0
BG0000620	Pomorie	B	01.01. 2004	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	2085,15	54,1

BG0000621	Ezero Shabla - Ezerets	B	01.10. 2003	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	2623,53	65
BG0000622	Varnensko - Beloslavski kompleks	B	01.09. 2005	01.12. 2018	01.12. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	178,2	0
BG0000623	Taushan tepe	B	01.09. 2007	01.07. 2015	01.12. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	305,26	0
BG0000624	Lyubash	B	01.09. 2007	01.12. 2018	01.12. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	1267,04	0
BG0000625	Izvoro	B	01.09. 2007	01.07. 2015	01.12. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	7,04	0
BG0000626	Krushe	B	01.09. 2007	01.12. 2018	01.12. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	291,87	0
BG0000627	Konunski dol	B	01.10. 2010	01.07. 2015	01.11. 2010	01.11. 2012	Adopted by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	779,06	0
BG0000628	Chirpanski vazvishenia	B	01.10. 2010	01.07. 2015	01.11. 2010	01.11. 2012	Adopted by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	12321,42	0
BG0000631	Novo selo	B	01.10. 2010	01.12. 2018	01.11. 2010	01.11. 2012	Adopted by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	815,91	0
BG0000635	Devnenski halmove	B	01.12. 2013	01.02. 2019	01.04. 2014	01.11. 2015	Adopted by Council of Ministers Decision No. 223/24.04.2014 (promulgated SG 37/2014). Issued by the Minister of Environment and Water designation Order No. RD – 792/20.12.2018 (promulgated SG 9/2019) with prohibitions and restrictions on activities contradicting the conservation objectives of the site.	297,75	0
BG0000636	Niska Rila	B	01.10. 2018		01.04. 2019		Adopted by Council of Ministers Decision No. 177/03.04.2019 (promulgated SG 29/2019).	37191,67	0
BG0001001	Ropotamo	B	01.06. 2006	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Modified in the marine part by Council of Ministers Decision No. 660/01.11.2013 (promulgated SG 97/2013).	98099,76	89,9
BG0001004	Emine - Irakli	B	01.06. 2006	01.12. 2018	01.12. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Modified in the marine part by Council of Ministers Decision No. 660/01.11.2013 (promulgated SG 97/2013).	16794,59	45,7
BG0001007	Strandzha	B	01.06. 2006	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Modified in the marine part by Council of Ministers Decision No. 660/01.11.2013 (promulgated SG 97/2013).	153541,2	24,5
BG0001011	Osogovska planina	B	01.07. 2006	01.12. 2018	01.10. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007).	34513,24	0
BG0001012	Zemen	B	01.09. 2006	01.12. 2018	01.10. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007). Extended by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	17758,04	0
BG0001013	Skrino	B	01.09. 2006	01.12. 2018	01.10. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007). Extended by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	12755,46	0
BG0001014	Karlukovo	B	01.03. 2006	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	28841,93	0
BG0001017	Karvav kamak	B	01.08. 2006	01.12. 2018	01.10. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007).	17680,37	0
BG0001021	Reka Mesta	B	01.04. 2006	01.12. 2018	01.12. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	19401,69	0
BG0001022	Oranovski prolom - Leshko	B	01.07. 2006	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	13245,47	0
BG0001023	Rupite - Strumeshnitsa	B	01.07. 2006	01.12. 2018	01.12. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007).	10458,74	0
BG0001028	Sreden Pirin - Alibotush	B	01.04. 2006	01.12. 2018	01.12. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Extended by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	68934,39	0
BG0001030	Rodopi - Zapadni	B	01.09. 2006	01.12. 2018	01.10. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007). Extended by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	272851,41	0
BG0001031	Rodopi - Sredni	B	01.09. 2006	01.12. 2018	01.10. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007). Extended by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	155107,68	0
BG0001032	Rodopi - Iztochni	B	01.09. 2006	01.12. 2018	01.03. 2007	01.12. 2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007). Extended by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	217446,89	0

BG0001033	Brestovitsa	B	01.09.2006	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	2670,58	0
BG0001034	Ostar kamak	B	01.09.2006	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	15994,31	0
BG0001036	Balgarski izvor	B	01.09.2006	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	2618,99	0
BG0001037	Pastrina	B	01.09.2006	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	3551,58	0
BG0001039	Popintsi	B	01.09.2006	01.12.2018	01.10.2007	01.12.2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007).	20906,72	0
BG0001040	Zapadna Stara planina i Predbalkan	B	01.03.2006	01.12.2018	01.10.2007	01.12.2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007). Extended by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	219753,26	0
BG0001042	Iskarski prolom - Rzhana	B	01.07.2006	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	22693,26	0
BG0001043	Etropole - Baylovo	B	01.07.2006	01.12.2018	01.10.2007	01.12.2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007).	27448,25	0
BG0001307	Plana	B	01.09.2006	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	2785,72	0
BG0001375	Ostritsa	B	01.09.2006	01.12.2018	01.03.2007	01.12.2008	Adopted by Council of Ministers Decision No. 122/02.03.2007 (promulgated SG 21/2007).	4429,5	0
BG0001386	Yadenitsa	B	01.09.2006	01.12.2018	01.10.2007	01.12.2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007).	17016,21	0
BG0001389	Sredna gora	B	01.09.2006	01.12.2018	01.10.2007	01.12.2008	Adopted by Council of Ministers Decision No. 661/16.10.2007 (promulgated SG 85/2007). Extended by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	110373,64	0
BG0001493	Tsentralen Balkan - bufer	B	01.09.2006	01.12.2018	01.12.2007	01.12.2008	Adopted by Council of Ministers Decision No. 802/04.12.2007 (promulgated SG 107/2007). Extended by Council of Ministers Decision No. 811/16.11.2010 (promulgated SG 96/2010).	138363,82	0
BG0001500	Aladzha banka	B	01.07.2012	01.07.2015	01.11.2013	01.11.2015	Adopted by Council of Ministers Decision No. 660/01.11.2013 (promulgated SG 97/2013).	669,64	100
BG0001501	Emona	B	01.07.2012	01.07.2015	01.11.2013	01.11.2015	Adopted by Council of Ministers Decision No. 660/01.11.2013 (promulgated SG 97/2013).	55345,28	100
BG0001502	Otmanli	B	01.07.2012	01.07.2015	01.11.2013	01.11.2015	Adopted by Council of Ministers Decision No. 660/01.11.2013 (promulgated SG 97/2013).	8,83	100