

Challenges for Habitat and Species Conservation in the Natura 2000 Network, Bulgaria: an Overview from Two Special Protection Areas

Stoyan C. Nikolov^{1*}, Yurii Kornilev¹, Georgi Popgeorgiev¹, Stoycho Stoychev¹, Boyko B. Georgiev²

¹Bulgarian Society for the Protection of Birds / BirdLife Bulgaria, Yavorov Complex, Bl. 71, Vh. 4, PO Box 50, 1111 Sofia, Bulgaria, www.bspb.org

²Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences, 2 Gagarin Street, 1113 Sofia

Abstract: The Natura 2000 network has been created across the European Union to enhance the conservation of biological diversity together with regional sustainable development. Although it covers 18% of the area of the 28 member states (Bulgaria being amongst the countries with the highest coverage, with 34.4%), there is still uncertainty about its long-term effectiveness. Here, we summarise the results of 18 contributions representing *Supplement 5 of Acta zoologica bulgarica*. These studies have been conducted primarily under the project “Conservation of globally important biodiversity in high nature value semi-natural grasslands through support for the traditional local economy” (2007–2011) in Bulgaria. The reviewed studies cover two Special Protection Areas, Ponor and Besaparski Ridove, within the Natura 2000 network and discuss current inventory and conservation topics on various elements of local biodiversity, such as open and forest habitats, vascular plants, invertebrates, amphibians, reptiles, birds, bats and terrestrial small mammals. A wide range of threats was identified, some of them being site- or group-specific while others were common and related mainly to habitat loss and degradation. The common nature of the environmental problems demonstrates the main challenges to the implementation of Natura 2000 in Bulgaria and the urgent need of management plans for the network sites. In order to fulfil the purpose of the ecological network for more efficient conservation of biodiversity in Bulgaria, the most important priority measures include ensuring a legislative mechanism for adequate management, regular monitoring and better control.

Keywords: Nature conservation, Ecological network, Threatened species, Management plan

Introduction

The present introductory article summarises the results of 18 contributions to *Supplement 5 of Acta zoologica bulgarica*. These studies have been conducted under the project “Conservation of globally important biodiversity in high nature value semi-natural grasslands through support for the traditional local economy” (GEFSEC Project №43595) carried out in 2007–2011 in Bulgaria. The studies presented cover two Special Protection Areas (SPA) – Ponor and Besaparski Ridove, within the Natura 2000 network.

Both SPA shelter relatively high biodiversity and representatives of conservation importance: habitats (DIMITROV, PETROVA 2014a,b, TZONEV *et al.* 2014a,b), flora (PEDASHENKO, VASSILEV 2014, VASSILEV *et al.* 2014), invertebrates (STOEV *et al.* 2014, STOJANOVA 2014), amphibians and reptiles (POPGEOGIEV *et al.* 2014a,b), birds (DEMERDZHEV 2014, DYULGEROVA, NIKOLOV 2014), bats (PETROV *et al.* 2014, STOICHEVA *et al.* 2014) and terrestrial small mammals (KOSHEV 2014, NEDYALKOV, KOSHEV 2014). The two SPAs

*Corresponding author: stoyan.nikolov@bspb.org

are located relatively close to the biggest cities in Bulgaria (Sofia and Plovdiv, respectively, <70 km ; see Maps 1-2, pages 222-223) and represent adequate examples for the challenges and problems of implementation and management that the Natura 2000 network faces in Bulgaria.

Natura 2000 in Europe

Currently, biodiversity is in rapid decline globally, Europe being no exception (WANDESFORDE-SMITH, WATTS 2014). A substantial legislative step towards international administration of efforts for biodiversity conservation has been the adoption of the Rio de Janeiro Convention on Biological Diversity (CBD) in 1992, ratified in Europe in 1993 (BALMFORD *et al.* 2005). In response to the CBD, which recommended adoption of strategies aiming to ensure the conservation and sustainable use of biodiversity, the European Community established a network of protected sites entitled Natura 2000. The goal of the network is to maintain the biological diversity hand in hand with regional sustainable development, considering the economic, social and cultural context. Natura 2000 is governed by the Directive 2009/147/EC (amended and coded version of Directive 79/409/EEC, adopted in 1979), known as the “Birds Directive”, for the conservation of wild birds, and the Directive 92/43/EEC (adopted in 1992) for the conservation of natural habitats, wild fauna and flora, known as the “Habitats Directive”. These two directives define the two main site categories: Special Protection Area (SPA, for the rare and threatened European bird species) and Sites of Community Importance (SCI, for plants, animals and wildlife habitats); sites of these two types may partially or completely overlap (DG ENVIRONMENT 1979, 1992). Currently, the Natura 2000 network consists of 27,308 sites covering a total of 18.36% of the area of the 28 EU member states, with percentage of national territory designated to the Natura 2000 ranging from 8.32% in Denmark to 37.85% in Slovenia (EUROPEAN COMMISSION 2014).

Although in existence for multiple years in Europe, still there are problems with the implementation (e.g. GRODZINSKA-JURCZAK, CENT 2011) and uncertainty on the effectiveness of Natura 2000 (e.g. GRUBER *et al.* 2012, WANDESFORDE-SMITH, WATTS 2014). Most of these problems are similar amongst countries and relate to issues of administration, lack of scientific data and tools, and social problems (APOSTOLOPOULOU, PANTIS 2009, KEULARTZ 2009, BRYAN 2012). In terms of effectiveness, TROCHET and SCHMELLER (2013) found that over 90% of the distributions of a large proportion of threatened spe-

cies of mammals, birds and reptiles are covered by the current Natura 2000 network, and the network also covers species not listed in the annexes of the Nature Directives. However, certain taxa are under-represented: a large proportion of threatened species of fish is poorly covered by the Natura 2000 network. The coverage of species likely seemed to be highly related to national demographic factors, and the designation of sites depends strongly on governmental politics, economic and cultural criteria, and interactions between society and the environment (TROCHET, SCHMELLER 2013). The need of a more effective process is highlighted to ensure that Natura 2000 fulfils its potential as the most important and comprehensive network of protected areas in Europe intended to halt the loss of biodiversity on the continent in the near future (TROCHET, SCHMELLER 2013, WANDESFORDE-SMITH, WATTS 2014). Fundamental steps in this direction, especially regarding the recent EU member states (such as Bulgaria), are to solve the problem with lack of scientific data within Natura 2000, evaluate the effectiveness of the network urgently and promote effective dialogue and collaboration between the NGOs, scientific community, authorities and land owners.

Natura 2000 in Bulgaria: adoption process and challenges

Bulgaria adopted the Natura 2000 network in 2007, after joining the European Union (EU). However, the process of identification of important biodiversity sites was started in 1990–1996 when the first 66 Important Bird Areas (IBAs) were identified (KOSTADINOVA 1997). In 2003–2006, the number of proposed IBAs increased to 114 (KOSTADINOVA, GRAMATIKOV 2007) and 225 potential SCIs were identified by the environmental non-governmental organizations (NGOs) and scientific community. In 2006, all these potential Natura 2000 sites were submitted to the Ministry of Environment and Water (MOEW), covering 23.6% of the country’s area for SPAs and 28.6% for potential SCIs; due to the overlap, the total coverage of the initially proposed Natura 2000 network was 36.1%. This resulted in strongly polarized opinions on the Natura 2000 network: opposition by representatives of entities such as resort developers, wind power business, logging companies and land owners in tourist areas, and support by many citizens, environmental NGOs, the research community and the Union of Hunters and Anglers in Bulgaria. In February 2007, the Bulgarian Government adopted and sent to the European Commission 88 SPAs and 196 SCIs, covering respectively 11.3% and 13.4% of the country’s

Table 1. Threats on the biodiversity at Ponor and Besaparski Ridove SPAs; * - present in only one of the studied SPAs; ** - present in both SPAs; ? - insufficient information; “_” - threat not identified in publication. The sources are provided below the table

Threat	Open habitats 1,2,3	Forest habitats 4,5	Flora 6,7	Invertebrates 8,9	Herpetofauna 10,11	Avifauna 12,13,14	Bats 15,16	Terrestrial small mammals 17,18
Habitat loss and degradation								
Conversion of grasslands to arable lands	**	–	*	*	**	**	–	**
Decline in livestock	**	–	*	*	–	**	–	**
Inadequate and illegal forest cutting	–	**	–	–	–	**	**	*
Removal of dead wood	–	**	–	–	–	–	–	–
Removal of shrubs in pastures/meadows	–	–	–	–	–	**	–	*
Presence of exotic and non-native species	–	*	*	–	–	–	*	–
Fires/burning of residual herbage and shrubs	*	?	*	*	**	**	–	*
Construction and infrastructure (incl. wind turbines, solar parks and quarries)	–	–	*	–	–	**	**	*
Overgrazing	**	**	*	–	–	*	–	–
Change in water regime	*	**	*	–	**	*	*	–
Removal of riparian vegetation/forest	–	*	?	–	–	–	–	–
Succession of habitats/land abandonment	*	**	*	–	–	**	–	*
Unauthorised and improper extraction of non-timber forest resources	–	–	–	–	–	–	–	–
Use of chemicals (e.g. fertilizers, pesticides, etc.)	–	–	–	*	–	*	**	*
Uncontrolled waste disposal	–	–	–	*	–	*	–	–
Fragmentation of habitats	*	–	–	–	*	–	–	*
Disturbance and direct mortality								
Recreation and tourism	–	–	–	–	–	**	*	–
Inappropriate timing and method of mowing	–	–	–	–	–	*	–	–
Human disturbance	–	–	–	–	–	**	*	–
Dangerous power supply network	–	–	–	–	–	*	–	–
Intentional/non-intentional poisoning	–	–	–	–	–	**	–	*
Poaching	–	–	–	–	–	**	–	**
Global changes								
Climate warming	–	–	–	–	–	–	–	*

Legend: Sources from Supplement 5 indicated as superscript numbers, as follows:^{1,2}TZONEV *et al.* (2014a,b);³DOBREV *et al.* (2014);^{4,5}DIMITROV, PETROVA (2014a,b); ⁶PEDASHENKO, VASSILEV (2014); ⁷VASSILEV *et al.* (2014); ⁸STOEY *et al.* (2014); ⁹STOJANOVA (2014); ^{10,11}POPGORGIEV *et al.* (2014a,b); ¹²DEMERTZHEV (2014); ¹³DEMERTZHEV *et al.* (2014); ¹⁴DYULGEROVA, NIKOLOV (2014); ¹⁵PETROV *et al.* (2014); ¹⁶STOJANOVA *et al.* (2014); ¹⁷KOSHEV (2014); ¹⁸NEDYALKOV, KOSHEV (2014).

area (the total coverage of the adopted Natura 2000 network was 18%, or with 50% less than initially proposed). In December 2007, the Natura 2000 was reassessed, and 26 SPAs and 21 SCIs that had initially been rejected were finally adopted (however, the area was reduced in 6 sites). Thus, the Natura 2000 in Bulgaria consisted of 114 SPAs and 228 SCIs with coverage of 20.4% and 29.5%, respectively (the total coverage of Natura 2000 network was 33.8%). However, an infringement procedure was started by European Commission after complaint submitted by the Bulgarian Society for the Protection of Birds / BirdLife Bulgaria. In May 2011, implementing requirements of the EC, the Bulgarian Government designated four new SPAs (Pirin Buffer, Central Balkan Buffer, Balgarka and Rilski Manastir) and enlarged two existing (Lomovete and Zapadni Rodopi). In October 2013, the Government enlarged the Kaliakra SPA covering the whole IBA and designated another new one (Bilo) in order to compensate for the already destroyed habitats in Kaliakra. New SCIs were designated as well. Thus, the current Natura 2000 in Bulgaria consists of 119 SPAs and 234 SCIs, with coverage of 22.74% and 30%, respectively (the total coverage of current Natura 2000 network is 34.4%)(MOEW 2014).

Nowadays, conservation challenges include lack of specialised administration dealing with the management and control of Natura 2000 sites, lack of management plans, easy land use change procedures, and insufficient capacity to implement appropriate assessment and screen development plans within the sites.

Biodiversity in Ponor and Besaparski Ridove: threats, conservation recommendations and perspectives

As a result of the contributions, we could summarise a wide range of threats, some of which were site- and group-specific, while others were shared between studied biodiversity elements and sites (Table 1). The most common threats (identified for more than 4 studied elements of biodiversity and shared as a threat in both SPAs in at least two studied groups) were related to habitat loss and degradation, and more precisely to (i) conversion of grasslands to arable lands, (ii) decline in livestock, (iii) inadequate and illegal forest cutting, (iv) fires and burning of residual herbage and shrubs, (v) construction and infrastructure (incl. wind turbines, solar parks and quarries), (6) overgrazing, (vi) change in water regime and (viii) land abandonment that may result in vegetation succession. On the other hand, there was evidence for inadequate management of habitats damaging the local biodiversity

within the SPAs, which was paradoxically supported by the state. For instance, the removal of shrub vegetation from pastures and meadows in Ponor, which, apart of destroying natural habitats protected under the Habitat Directive (VASSILEV *et al.* 2011, TZONEV *et al.* 2014a), has been shown to have a strong negative effect on avian diversity and the populations of many bird species subject of protection under the Annex 1 of the Birds Directive (NIKOLOV 2010). In the same time, this practice has been subsidised under the national Agri-environment Schemes (AES), without prior testing. Moreover, one of the main concerns for biodiversity conservation in Besaparski Ridove is related to the ploughing of grasslands, which has intensified in the recent years and which destroyed considerable amount (on average 6% per sampling plot) of grassland habitats (DOBREV *et al.* 2014) and, therefore, had strong negative impact on diverse taxa (DEMERDZHIEV 2014, NEDYALKOV, KOSHEV 2014, POPGEORGIEV *et al.* 2014b). This practice was supported by the state in the frames of the Common Agricultural Policy (CAP). For a wider discussion on the problems on habitat and species conservation due to the inappropriate application of CAP and AES, see DOBREV *et al.* (2014) and POPGEORGIEV *et al.* (2014b).

To mitigate and solve most of the above mentioned threats and problems, the following general measures were proposed to ensure both favourable status of biodiversity and sustainable benefits to the local communities (e.g. by accessing subsidies under the AEP and CAP, development of eco-friendly tourism): (1) scientifically-based spatial planning and zonation; (2) better control and proper Environmental Impact Assessment procedures; (3) support of extensive and traditional management practices (incl. appropriate amendment and supplementation of the relative legislation) and effective control for inadequate or illegal practices; (4) mechanisms for proper continuous observation and evaluation of the state of biodiversity within each Natura 2000 site. Although the present studies were focused on two SPAs, we speculate that most of the conclusions are applicable for most of the Natura 2000 sites in Bulgaria and the urgent need of adoption of management plans for all SPAs (and SCIs) is obvious.

Acknowledgments: Part of the data collected for the publications in *Supplement 5 of Acta zoologica bulgarica* as well as the publication of the special issue were financially supported by the GEF project “Conservation of globally important biodiversity in high nature value semi-natural grasslands through support for the traditional local economy” (GEFSEC Project №43595) carried out by the Bulgarian Society for the Protection of Birds. Authors are grateful to Irina Mateeva who provided constructive comments on earlier draft of this paper.

References

- APOSTOLOPOULOU E., J. D. PANTIS 2009. Conceptual gaps in the national strategy for the implementation of the European Natura 2000 conservation policy in Greece. – *Biological Conservation*, **142** (1): 221-237.
- BALMFORD A., L. BENNUN, B. TEN BRINK, D. COOPER, I. M. COTE, P. CRANE, A. DOBSON, N. DUDLEY, I. DUTTON, R. E. GREEN, R. D. GREGORY, J. HARRISON, E. T. KENNEDY, C. KREMEN, N. LEADER-WILLIAMS, T. E. LOVEJOY, G. MACE, R. MAY, P. MAYAUX, P. MORLING, J. PHILLIPS, K. REDFORD, T. H. RICKETTS, J. P. RODRIGUEZ, M. SANJAYAN, P. J. SCHEI, A. S. VAN JAARVELD and B. A. WALTHER 2005. The convention on biological diversity's 2010 target. – *Science*, **307**: 212-213.
- BRYAN S. 2012. Contested boundaries, contested places: The Natura 2000 network in Ireland. – *Journal of Rural Studies*, **28**: 80-94.
- DEMERDZHIEV D. A. 2014. Avifauna in Besaparski Ridove Special Protection Area (Natura 2000), southern Bulgaria: conservation status and dynamics. – *Acta zoologica bulgarica*, **Suppl. 5**: 171-190.
- DEMERDZHIEV D., V. DOBREV and G. POPGEORGIEV 2014. Effects of habitat change on territory occupancy, breeding density and breeding success of Long-legged Buzzard (*Buteo rufinus* Cretzschmar, 1927) in Besaparski Ridove Special Protection Area (Natura 2000), southern Bulgaria. – *Acta zoologica bulgarica*, **Suppl. 5**: 191-200.
- DG ENVIRONMENT 1979. Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds. Directorate-General Environment, European Commission. – *Official Journal*, **N. L103, 25/04/1979**, 25 p.
- DG ENVIRONMENT 1992. Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. Directorate-General Environment, European Commission. – *Official Journal*, **N. L206, 22/07/1992**, 52 p.
- DIMITROV M., D. PETROVA 2014a. Forest habitats in Ponor Special Protection Area (Natura 2000), western Bulgaria: characteristics, status assessment and management recommendations. – *Acta zoologica bulgarica*, **Suppl. 5**: 9-20.
- DIMITROV M., D. PETROVA 2014b. Forest habitats in Besaparski Ridove Special Protection Area (Natura 2000), southern Bulgaria: characteristics, status assessment and management recommendations. – *Acta zoologica bulgarica*, **Suppl. 5**: 129-136.
- DOBREV V., G. POPGEORGIEV and D. PLACHIYSKI 2014. Effects of the Common Agricultural Policy on the coverage of grassland habitats in Besaparski Ridove Special Protection Area (Natura 2000), southern Bulgaria. – *Acta zoologica bulgarica*, **Suppl. 5**: 147-155.
- DYULGEROVA S., S. C. NIKOLOV 2014. Avifauna in Ponor Special Protection Area (Natura 2000), western Bulgaria: Composition, conservation status and changes over the last 30 years. – *Acta zoologica bulgarica*, **Suppl. 5**: 97-106.
- EUROPEAN COMMISSION 2014. Natura 2000 Barometer – update December 2013. – *Natura 2000 Nature and Biodiversity Newsletter*, **36** (July 2014): 8-9.
- GRODZINSKA-JURCZAK M., J. CENT 2011. Expansion of Nature Conservation Areas: Problems with Natura 2000 Implementation in Poland? – *Environmental Management*, **47**: 11-27.
- GRUBER B., D. EVANS, K. HENLE, B. BAUCH, D. SCHMELLER, F. DZIOCK, P. Y. HENRY, S. LENGYEL, C. MARGULES and C. DORMANN 2012. "Mind the gap!" – How well does Natura 2000 cover species of European interest? – *Nature Conservation*, **3**: 45-62.
- KEULARTZ J. 2009. European Nature Conservation and Restoration Policy – Problems and Perspectives. – *Restoration Ecology*, **17** (4): 446-450.
- KOSHEV Y. S. 2014. Small mammals (Mammalia: Erinaceomorpha, Soricomorpha, Rodentia and Lagomorpha) in Ponor Special Protection Area (Natura 2000), western Bulgaria: species diversity, distribution and conservation. – *Acta zoologica bulgarica*, **Suppl. 5**: 107-115.
- KOSTADINOVA I. (Ed.) 1997. Important Bird Areas in Bulgaria. BSPB Conservation Series, Book No 1. Sofia (Bulgarian Society for the Protection of Birds). 176 p. (In Bulgarian).
- KOSTADINOVA I., M. GRAMATIKOV (Eds.) 2007. Important Bird Areas in Bulgaria and NATURA 2000. BSPB Conservation Series, Book No 11. Sofia (Bulgarian Society for the Protection of Birds). 639 p.
- MOEW 2014. Ministry of Environment and Waters – Natura 2000. Available at: <http://www.moew.government.bg/?show=top&cid=182> (Accessed on 18.12.2014)
- NEDYALKOV N. P., Y. S. KOSHEV 2014. Small mammals (Erinaceomorpha, Soricomorpha, Rodentia, Lagomorpha) in Besaparski Ridove Special Protection Area (Natura 2000), southern Bulgaria: species composition, distribution and conservation. – *Acta zoologica bulgarica*, **Suppl. 5**: 201-212.
- NIKOLOV, S. C. 2010. Effects of land abandonment and changing habitat structure on avian assemblages in upland pastures of Bulgaria. – *Bird Conservation International*, **20**: 200-213.
- PEDASHENKO H., K. VASSILEV 2014. Flora of Ponor Special Protection Area (Natura 2000), western Bulgaria. – *Acta zoologica bulgarica*, **Suppl. 5**: 33-60.
- PETROV B., I. ALEXandroVA, V. KARADAKOV, T. GEORGIEVA, N. TOSHKOVA and V. ZHELYAZKOVA 2014. Bats (Mammalia: Chiroptera) in Ponor Special Protection Area (Natura 2000), western Bulgaria: species diversity and distribution. – *Acta zoologica bulgarica*, **Suppl. 5**: 117-128.
- POPGEORGIEV G. S., N. D. TZANKOV, Y. V. KORNILEV, B. Y. NAUMOV and A. Y. STOYANOV 2014a. Amphibians and Reptiles in Ponor Special Protection Area (Natura 2000), western Bulgaria: species diversity, distribution and conservation. – *Acta zoologica bulgarica*, **Suppl. 5**: 85-96.
- POPGEORGIEV G. S., N. D. TZANKOV, Y. V. KORNILEV, D. G. PLACHIYSKI, B. Y. NAUMOV and A. Y. STOYANOV 2014b. Changes in agri-environmental practices pose a threat to the herpetofauna: a case study from Besaparski Ridove Special Protection Area (Natura 2000), southern Bulgaria. – *Acta zoologica bulgarica*, **Suppl. 5**: 157-169.
- STOEV P., C. DELTSHEV, D. BACHVAROVA and A. DOICHINOV 2014. Cave Invertebrates in Ponor Special Protection Area (Natura 2000), western Bulgaria: Faunistic Diversity and Conservation Significance. – *Acta zoologica bulgarica*, **Suppl. 5**: 75-84.
- STOJANOVA A. M. 2014. The Torymid Fauna (Insecta: Hymenoptera: Torymidae) of Besaparski Ridove Special Protection Area (Natura 2000), southern Bulgaria. – *Acta zoologica bulgarica*, **Suppl. 5**: 143-146.
- STOYCHEVA S., A. PAVLOVA, D. RUSSO, S. DELEVA and T. ATANASSOV 2014. Bats (Mammalia: Chiroptera) in Besaparski Ridove Special Protection Area (Natura 2000), southern Bulgaria:

- species list, distribution and conservation. – *Acta zoologica bulgarica*, **Suppl. 5**: 213-220.
- TROCHET A., D. S. SCHMELLER 2013. Effectiveness of the Natura 2000 network to cover threatened species. – *Nature Conservation*, **4**: 35-53.
- TZONEV R. T., C. V. GUSSEV and G. S. POPGEORGIEV 2014a. Scrub, grassland and rocky habitats in Ponor Special Protection Area (Natura 2000), western Bulgaria: mapping and assessment of conservation status. – *Acta zoologica bulgarica*, **Suppl. 5**: 21-32.
- TZONEV R. T., C. V. GUSSEV and G. S. POPGEORGIEV 2014b. Scrub and grassland habitats of Besaparski Ridove Special Protection Area (Natura 2000), southern Bulgaria: distribution and assessment of their conservation status. – *Acta zoologica bulgarica*, **Suppl. 5**: 137-142.
- VASSILEV K., H. PEDASHENKO, N. VELEV and I. APOSTOLOVA 2014. Grassland vegetation of Ponor Special Protection Area (Natura 2000), western Bulgaria. – *Acta zoologica bulgarica*, **Suppl. 5**: 61-74.
- WANDEFORDE-SMITH G., N. S. J. WATTS 2014. Wildlife Conservation and Protected Areas: Politics, Procedure, and the performance of failure under the EU Birds and Habitats Directives. – *Journal of International Wildlife Law & Policy*, **17**: 62-80.