Saint Nikola Wind Farm: 2012 Breeding Bird Survey

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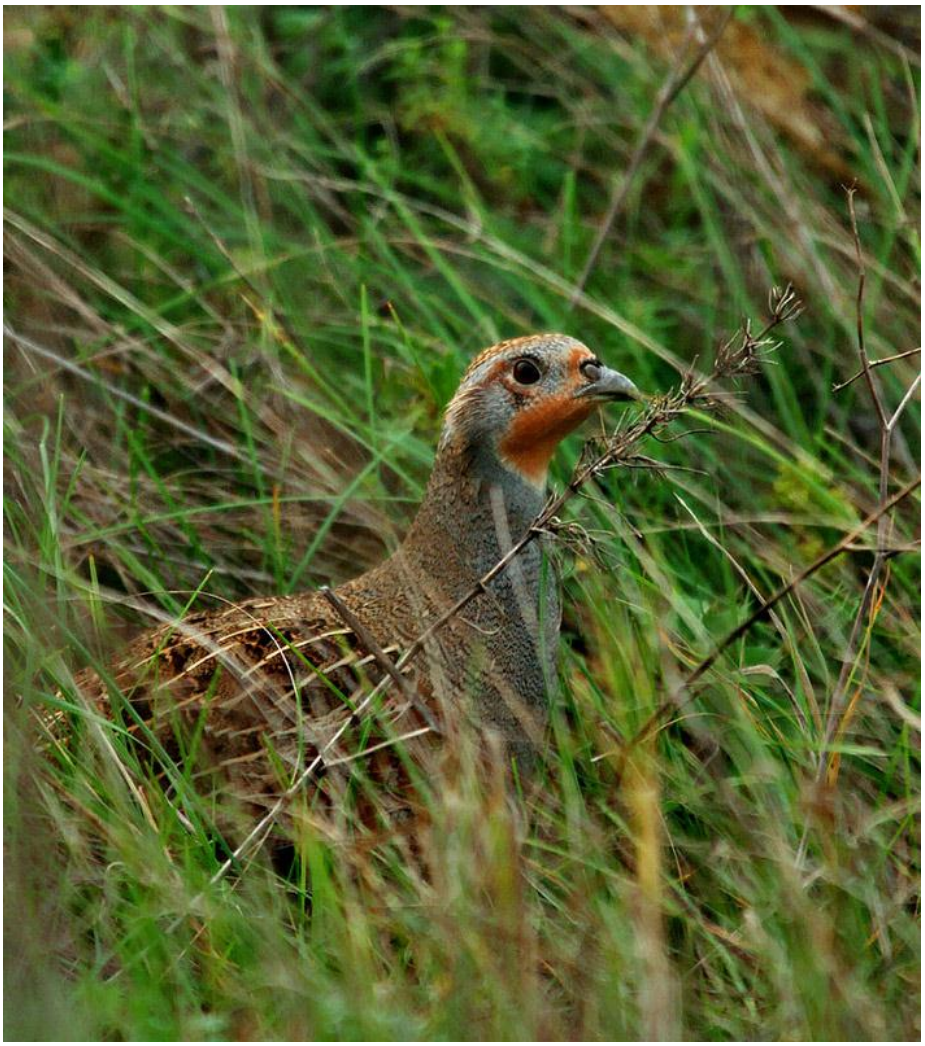

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Introduction

This report synthesizes the results of three months study performed in 2012 within the scope of the comparative analysis of the results from previous studies in 2009 and 2010. The comparative analysis of the surveys of breeding seasons 2009 and 2010 enabled a full Before-After-Control-Impact (BACI) analysis and the results did not indicate any adverse effect of the operational wind farm on the distribution or abundance of breeding birds (see report at http://www.aesgeoenergy.com/site/Studies.html). Therefore a detailed breeding bird survey comparable to those conducted in 2009 and 2010 was considered unnecessary in 2011. The 2011 breeding season observations conducted as part of the RIoEW Varna requirements have been submitted to the regional office of Bulgarian Ministry of Environment and Waters (RIoEW Varna) in accordance with the requirements of the Ministry. After the end of the mandatory one year period (March 2011) an annual summary report was also submitted to RIoEW Varna.

The comparative studies previously reported in pre- and post-operation periods revealed strong fluctuations in the number of species and their abundance in highly anthropogenised agricultural habitats, depending on the cultivated crops. Findings did not suggest that the SNWF territory is of particular conservation importance for breeding birds in the region.

In this study we aimed to identify the bird species breeding in the wind park territory (Saint Nikola Wind Farm: SNWF) and quantify their densities in order to re-visit the possibility that special measures may be needed concerning breeding birds within the wind farm, after two years of operation. The present study was focused on the identification of any high conservation value species or areas with special concentrations of breeding birds, together with an evaluation of the potential threats for birds breeding within the wind farm.

SNWF is located in NE Bulgaria, close to the Black Sea coast near the cape of Kaliakra and lies between the road from the village of Bulgarevo to St. Nikola (municipality of Kavarna), and the 1st class road E 87 Kavarna to Shabla (Fig. 1). SNWF consists mainly of arable land with different crops (e.g. wheat, sunflower, flax), intersected with roads and shelter belts. SNWF includes areas outside the Natura 2000 site Kaliakra.

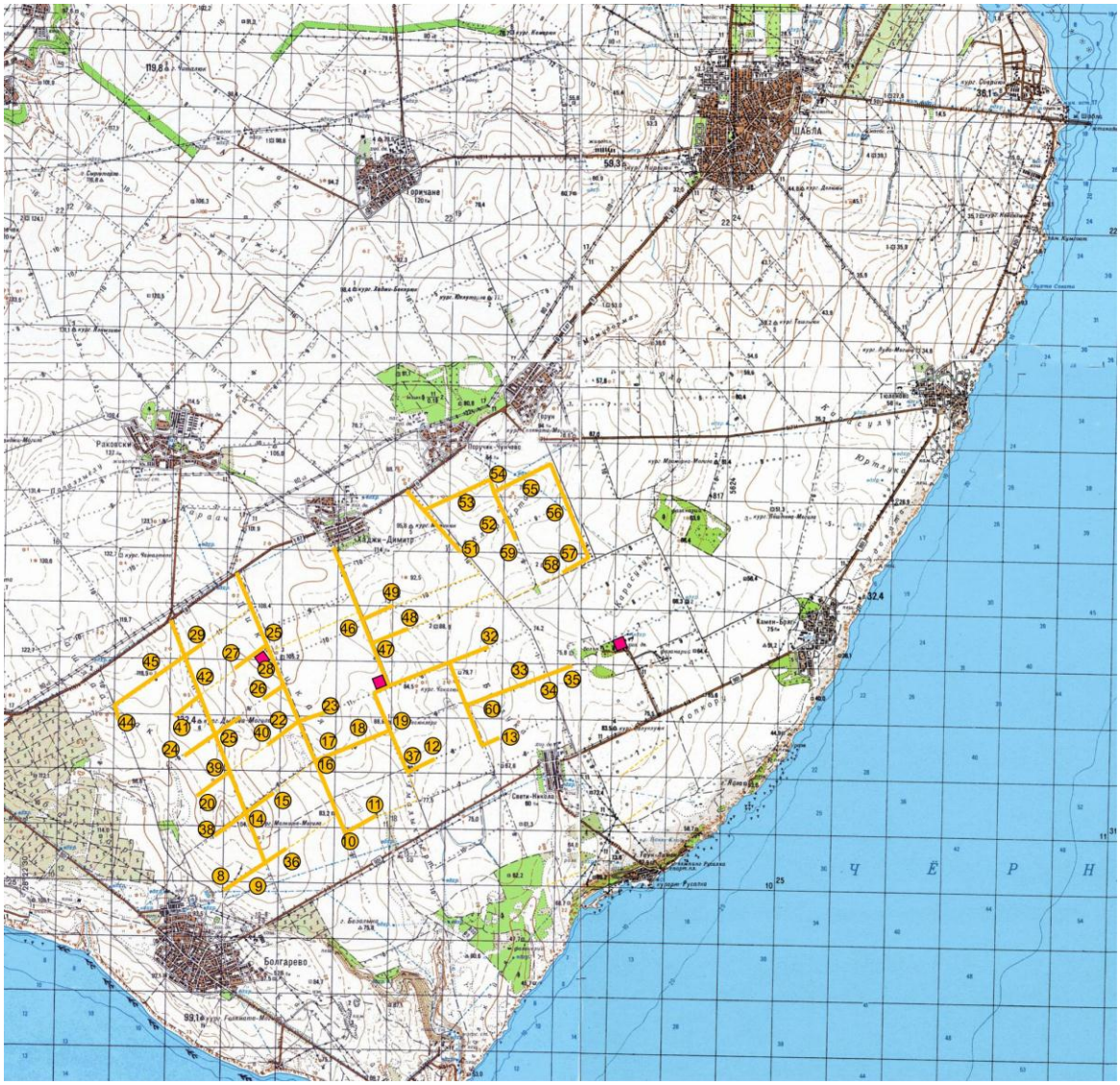

Figure 1. Location of SNWF with indicated number and locations of turbines. The transect routeing followed the road connections of all 52 turbines.

Methods

The methods are based on those used for breeding bird atlas surveys. In order to obtain comparable quantitative results concerning breeding birds, the same methods as in 2009 were applied. They are designed to comprehensively categorise the breeding bird assemblage in the survey area. The results of the survey area were assessed against the European Ornithological Atlas Committee's (EOAC) criteria for breeding bird status. The transects used in the breeding season 2012 followed road connections between turbines presented in Figure 1.

Details of the vegetation along each transect were recorded to allow future analysis of changes in the breeding bird assemblage which may result from change in habitat (e.g. crop type). An inventory of the species composition of breeding birds in SNWF has already been completed and any major changes to these were the subject of present survey.

The transects were conducted in April (11 -13 and 21 – 24) by Victor Vasilev and in May (8 – 9) and June (2-4) by Dimitar Dimitrov and Mihaela Ilieva. Each transect included all of the 52 turbines and roads within the SNWF territory (Fig. 1) and was walked once every month. The total length of a transect was around 42 km and it was walked for two or three days every month.

The surveys started no earlier than one hour after sunrise and no later than 09:00. The transect was walked three times over the survey period. Every species observed was recorded on the maps using two letter species codes with corresponding activity codes. The activity allowed assessment of the results against the EOAC criteria for breeding activity.

Details of the vegetation along transect were recorded in order to allow analysis of changes in the breeding bird assemblage which may result from change in habitat (e.g. crop type). The numbers of observed breeding birds in distance bands of 25, 100 and 200 metres from the observer were recorded. This approach allowed precise evaluation of the spatial distribution of the breeding birds and the composition of species in different habitats.

For calculation and simple presentation of the breeding density of birds the total length of the transect (42 km) was multiplied by the maximum extent of the observation distance bands (i.e. a 200m zone on each side of the observer, giving a 400 m survey area around the transect). In total, therefore, 16.8 km^2 was investigated for the current analysis of the breeding bird community in SNWF territory.

For further details on the basic survey methods see the “SAINT NIKOLA KAVARNA WIND FARM Owners Monitoring Plan“ and previous reports from the breeding season studies within SNWF.

Results

The breeding density of observed bird species along the transects (in the range of 200 metres along the main roads and turbines) is presented in Table 1. Because the distribution of species within SNWF obviously highly depended on the habitats surrounding roads and turbines, a detailed description of breeding birds by habitats is given below.

Composition of species and numbers of breeding birds in the agricultural fields

The main crop within SNWF was wheat. The fields with wheat covered around 70% of the investigated study area (Fig. 2). The study area also covered sunflower and corn fields but at a much lower proportion compared to wheat. Crops such as rape and lucerne were cultivated on less than 10% of the territory and therefore are not considered separately.

The most numerous species in the whole territory of agricultural fields was skylark (*Alauda arvensis)*. The number of skylarks apparently varied depending on the crop type, but this was the most common species at over 80% of SNWF territory. The second most numerous species was calandra lark (*Melanocorypha calandra)* with its main concentration being in abandoned fields and at boundaries between fields and semi steppe vegetation, mainly at the edges of SNWF territory.

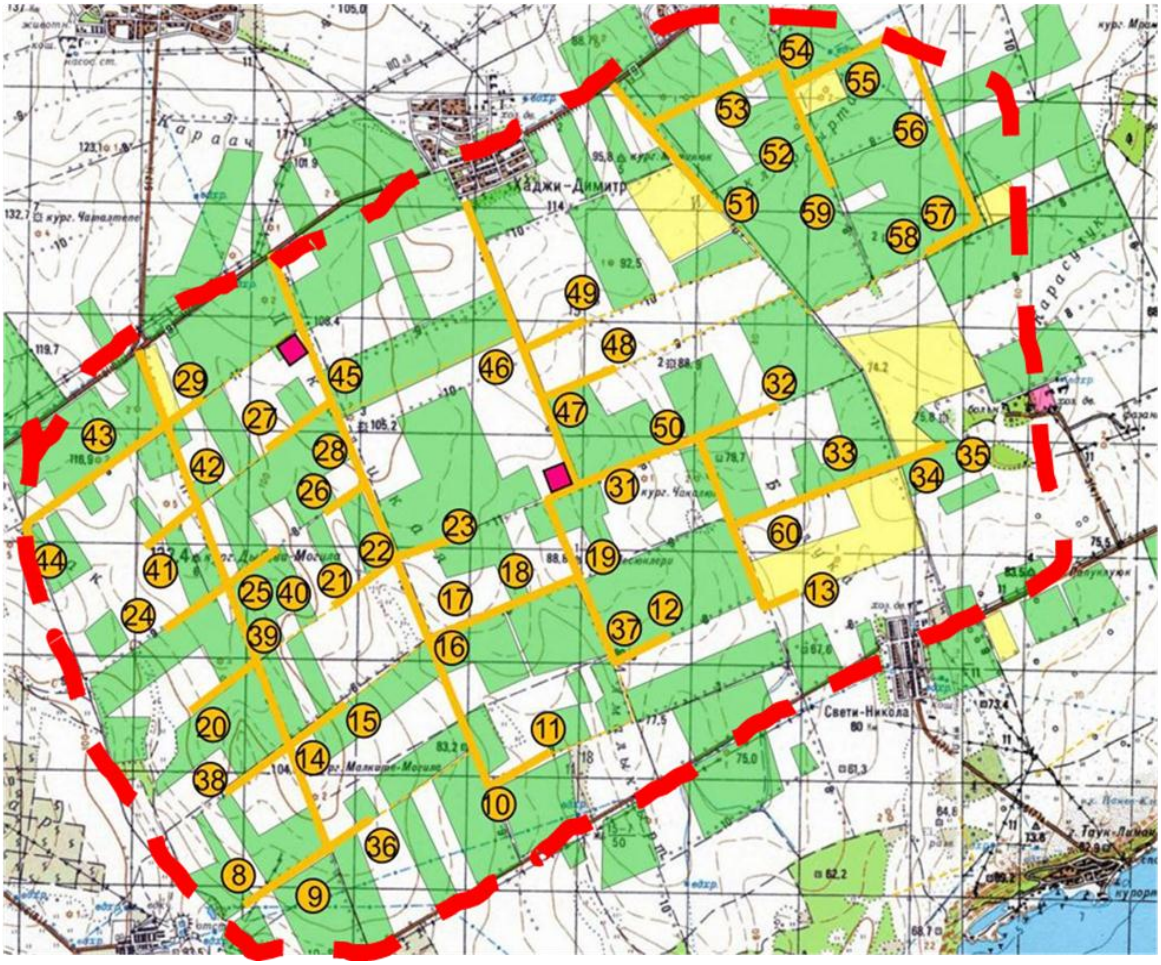

Figure 2. Map showing the main agricultural crops in SNWF territory in the environs of the study area (indicated by a red dashed line). Green – wheat, white – sunflower and corn, yellow – rape.

Species in wheat fields

Wheat was the predominant crop in the SNWF study area (Fig.2). Seven bird species were recorded breeding in wheat fields. Most numerous was skylark (*Alauda arvensis)* (Table 1). Second most common was yellow wagtail *(Motacilla flava)*. Quail (*Coturnix coturnix*) was relatively rare in wheat fields. Single pairs of corn buntings *(Miliaria calandra),* black-headed buntings (*Emberiza melanocephala)* and grey partridges *(Perdix perdix*) were also recorded breeding in wheat; often close to the end of the fields.

Picture 1. Skylark is the most numerous breeding species in SNWF

Species in sunflower fields

Four species were found breeding in the sunflower fields. As in the wheat fields, the most numerous was skylark. Relatively lower was the breeding density of yellow wagtails. Single pairs of grey partridges and black-headed buntings were also observed as breeding in sunflower crops.

Species in corn fields

The proportion of corn cultivation was very small in the SNWF study area. Three breeding species are established in such fields. The most numerous species, again, was the skylark. Yellow wagtails and grey partridges were not found breeding in corn.

Calandra larks (*Melanocorypha calandra*) were observed to breed in relatively high density in the field boundaries of all kinds of crops. Overall, this species was the second

most numerous in the wind farm territory followed by corn bunting (*Miliaria calandra*) and yellow wagtail (*Motacilla flava*) (for details see Table 1).

Breeding birds in shelterbelts

In the spring of 2012, 28 species of birds were recorded breeding in the shelterbelts. Most numerous were small passerine species (Passeriformes).

The rest of the species belong to the following orders: 2 Columbiformes, 1 Caprimulgiformes, 1 Cuculiformes, 1 Piciformes, 1 Galliformes and Strigiformes.

Picture 2. The magpie is a common species in the shelterbelts

Spanish sparrows (*Passer hispaniolensis*) are the dominant species in the shelterbelts by number. This was mainly because the species breeds in colonies in the shelterbelts with 15 – 20 pairs together in an area of less than 100 metres. Lesser shrike (*Lanius minor*) was also one of the numerous species in the shelterbelts.

These two species, together with less numerous nightingales (*Luscinia megarhynchos*), three species of buntings (*Miliaria calandra*, *Emberiza hortulana* and *E. melanocephala*), red-backed shrike (*Lanius collurio*), turtle dove (*Streptopelia turtur*),

golden oriole (*Oriolus oriolus*), starling (*Sturnus vulgaris*) and blackbirds (*Turdus merula*), made the largest contribution to the breeding bird community in this specific habitat for Dobroudja. In total the sum of individuals belonging to these species reached over 80% of all birds in this habitat. These are primarily birds relying to some extent on trees and woodland and this is probably why the shelterbelts elevate the species diversity in the predominantly open agricultural landscape. Records of typical forest birds like greater spotted woodpecker (*Dendrocopos major*), and nightjar (*Caprimulgus europaeus*) and greenfinch (*Carduelis chloris*), albeit relatively rare, indicate the potential role of shelterbelts as corridors for forest birds in the poor agrobiocenozes which are the main habitats of SNWF.

The younger shelterbelts (up to 20 years old) were less diverse in species. In such habitat the main species were corn bunting (*Miliaria calandra*) and black-headed bunting (*Emberiza melanocephala*).

Picture 3. The black-headed bunting is a common species in the younger shelter-belts

The older (40 - 50 years old) shelterbelts were characterized by lesser grey shrike (*Lanius minor*), golden oriole (*Oriolus oriolus*) and Spanish sparrows (*Passer hispaniolensis*) as common species. The relatively higher diversity of vegetation in the older shelterbelts is also apparently preferred by red-backed shrikes (*Lanius collurio*), nightingales (*Luscinia megarinchos*), magpies (*Pica pica*), blackbirds (*Turdus merula*), and starlings (*Sturnus vulgaris*), as well as birds of prey hunting in the territory. The overall breeding density and species diversity were both substantially higher than in the younger shelterbelts.

Picture 4. A juvenile song thrush (*Turdus philomelos*): this species nests in relatively low numbers in shelterbelts.

The diversity of breeding bird species is poor in the SNWF territory. The agrobiocenoses which cover around 90% of the study area are poor in biodiversity after its long period of agricultural modifications. Such highly modified plant monocultures probably provide limited resources for breeding birds because of intensive use of pesticides.

Table 1. Average breeding density of the most commonly recorded breeding bird species in SNWF during 2012, based on the average count recorded during the three survey periods, within 200m of the transect. Conservation status of species is given as follows: A – globally threatened species; B- species of European conservation concern; C- nationally threatened species.

Species name	**Cons. status**	**Average number (for April, May and June)**	**Density (records/km^2)**
Alauda arvensis	*B*	67	3,9
Anthus campestris	*BC*	0,16	0,009
Anthus trivialis		0,64	0,03
Carduelis cannabina		0,04	0,002
Carduelis carduelis	*B*	0,72	0,04
Carduelis spinus		1,24	0,07
Coccothraustes coccothraustes		1,08	0,064
Corvus cornix		0,8	0,04
Coturnix coturnix	*B*	0,24	0,014
Cuculus canorus		0,60	0,03
Dendrocopos major		0,70	0,03
Emberiza hortulana	*BC*	9,10	0,53
Emberiza melanocephala	*B*	10,30	0,60
Erithacus rubecula		2,60	0,15
Ficedula albicollis	*C*	0,50	0,03
Ficedula hypoleuca	*C*	1,60	0,08
Fringilla coelebs		1,00	0,05
Galerida cristata	*B*	0,20	0,01
Garrulus glandarius		3,90	0,23
Lanius collurio	*B*	5,00	0,28
Lanius minor	*BC*	10,60	0,63
Lanius senator	*B*	0,20	0,01
Luscinia megarhynchos		4,60	0,25
Melanocorypha calandra	*BC*	29,20	1,73
Miliaria calandra		12,10	0,70
Motacilla alba		1,80	0,10
Motacilla flava		11,00	0,65
Muscicapa striata	*B*	0,60	0,03
Oenanthe oenanthe	*B*	1,00	0,05
Oriolus oriolus		13,10	0,78
Parus major		0,20	0,01
Passer domesticus	*B*	4,70	0,28
Passer hispaniolensis		20,70	1,23
Passer montanus		0,20	0,01
Perdix perdix		1,60	0,08
Phoenicurus ochruros		0,10	0,01
Phylloscopus collybita		1,70	0,10
Pica pica		7,10	0,40
Saxicola rubetra		0,40	0,02
Streptopelia decaocto		1,60	0,08
Streptopelia turtur	*B*	5,00	0,28
Sturnus vulgaris	*B*	78,10	4,63
Sylvia atricapilla		0,70	0,03

Species name	Cons. status	Average number (for April, May and June)	Density (records/km^2)
Sylvia communis		2,90	0,15
Sylvia curruca		0,20	0,01
Turdus merula		13,80	0,80
Turdus philomelos		2,60	0,15
Turdus pilaris		0,20	0,01
Upupa epops	*B*	0,40	0,02
Vanellus vanellus		0,10	0,01

No globally threatened species were confirmed as breeding under the EOAC criteria for determining breeding bird status. Recorded densities of birds in the 2009 and 2010 surveys as well as in 2012 are comparable with those given in the recently published Atlas of Breeding Birds in Bulgaria, moreover, and do not indicate any special conservation importance of the wind farm territory, either by way of the presence or density of individual species, or species diversity. This, in turn, indicates that no measures need to be enacted towards treatment of SNWF as a 'special' area for breeding birds.

The records of the crops cultivated within the SNWF study area made between 2009, 2010 and 2012 illustrated only a slight change across years.

Conclusions

1. The Breeding Bird Survey in 2012 registered a similar composition of species and breeding density of typical farmland bird species as observed elsewhere in Bulgaria and in breeding bird surveys conducted at SNWF in 2009 and 2010.

2. The number of species as well as their abundance remained similar after the first two years of the wind farm's operation, in 2012, as it was before the operation of the wind farm.

3. There were no breeding species of high conservation value registered in significant numbers, or within zones with high conservation values due to unusual concentrations of species of conservation concern, in the wind farm territory.

References

AES Geo Energy. 2008. Saint Nikola Kavarna Wind Farm. Environmental Management and Monitoring Plan. Report from RSK Environment Ltd. to AES Geo Energy. RSK, Glasgow.