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Possible New File

Construction of the Kaliakra wind farm parks (Bulgaria)

Report by the NGO

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The potential threat of windfarms in the Kaliakra area (NE Bulgaria) on bird migrants

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1. Summary

This is an independent report produced by Dr. Felix Liechti from the Swiss Ornithological Insitute (with recognised international expertise in bird migration research) for the Bern Convention Standing Committee. The report analysis the potential threats to migrating birds by the proposed wind farms at Kaliakra (Bulgaria). The conclusion are that

- the proposed site is situated within one of the worldwide most important flyways for soaring birds.
- the specific topographical situation entails temporarily very high local concentrations.
- these concentrations are coupled with wind conditions reducing flight manoeuvrability, and therefore present a very high collision risk.
- according to the current knowledge, the proposed wind farms in the Kaliakra area are likely to produce regular mass casualties.
- the environmental impact assessment (EIA) did not consider these aspects.
- alternative sites further inland would release the potential risk considerably.

2. Introduction

There are several projects planned to produce renewable energy by constructing wind farms along the Black Sea coast of Bulgaria (BSPB et al, 2005). Although the production of renewable energy is highly desirable to reduce atmospheric pollution, it must be ensured that other natural goods, such as biodiversity are not affected by these activities. Environmental benefits and costs must be considered as a whole and balanced with great care.

Consent has already been given by the Bulgarian national and regional authorities to several of these wind farm projects without taking into account the significance of the Bulgarian Black Sea coast as one of the worldwide most important flyways for migratory birds.

Over the last 35 years the Swiss Ornithological Institute has built up an internationally recognised expertise in bird migration, with special emphasis on the quantification of migration and the flight behaviour of migratory birds. Research studies on bird migration in Europe and Africa by means of radar, yielded in mandates for EIA's in Israel, Germany and Italy (references see appendix). Our institute was asked by Birdlife International if we would carry out an independent analysis of the potential impact of the windfarm projects for a specific area, the cape Kaliakra. This report takes together the results from an on the spot visit, the study of topography and prevailing weather conditions and the analysis of field observation data collected during the last two years by the Bulgarian Society for the Protection of Birds (BSPB). As for many aspects the relevant data was lacking (with the exception of diurnal (daytime) soaring migration this report is strongly based on the author's experience gained during twenty years of research on bird migration.

2.1. General aspects of migration

In general, bird migration between breeding and non-breeding grounds takes place on a broad front. However, several features cause concentrations of migrants along their way to their goal. Coastlines are well known to invoke large concentrations of migrating birds, as sea birds, as well as land birds tend to avoid crossing unfavourable habitats (land or sea, respectively). Peak concentrations occur, when coastlines are more or less in line with the preferred flight direction and prevailing winds

provoke a displacement of birds flying from inland to the coast (or from the sea to the coast, respectively). This holds true for diurnal as well as nocturnal migration. In addition, soaring birds which need thermal lifts to proceed their migration, are only capable to do so over land, as thermals arise only over land. For most of these large birds migrating by soaring flight is a prerequisite for successful migration, because they are not capable to cover long distances by flapping flight. Thus, they avoid crossing the sea wherever they can, which results in huge concentrations along coastlines and the famous bottlenecks of soaring bird migration at Panama, Gibraltar and the Bosphorus.

All these aspects are present at the Black Sea coast from the Danube delta down to the Bosphorus. First, there are billions of birds migrating in autumn from Eastern Europe and Siberia towards the eastern Mediterranean Sea and further on to Africa. Second, migrants flying southward hit the Black Sea and tend to follow the coastline as it is almost identical to their prefered direction. Third, westerly winds dominate within this area, and have the potential to displace the birds towards the coast. We know that many migrants allow lateral drift over land but compensate for it at the coast (Liechti 2006). The Black Sea coast in Bulgaria is therefore a typical, so-called "leading line" for many different kinds of migratory birds, which means that migrants use the coastline actively to guide themselves safely towards the south.

2.2. The wind farm projects at Kaliakra

Cape Kaliakra has been identified as an Important Bird Area (IBA) by BirdLife International because of its importance as a bottleneck site for migrating birds and has been proposed for designation as a Special Protection Area (SPA) under the European Birds Directive when Bulgaria joins the EU. A small part (the coast tip) of the site is currently subject to national legal protection as „Cape Kaliakra strict reserve".

Information provided by BSPB/RSPB and Birdlife international:

To date (August 2006) 96 turbines of different Bulgarian private companies have been approved within the Kaliakra IBA. 19 of these turbines were approved (as single turbine or small wind farm projects) without Environmental Impact Assessments (EIAs), as under the Bulgaria Environmental Protection Act wind farms of capacity not exceeding 5MW do not require obligatory EIA, even if in sensitive areas. One of these turbines has already been constructed. Consent for the remaining 77 turbines have been granted. None of the EIAs included preliminary studies on the migrating, breeding or wintering birds as it would be expected for such a sensitive site; nor did the EIA/decision-making processes take into account the data on migrating birds presented by BSPB during the public hearings on the EIAs:

- Geopower Energy – 7 turbines on the edge of the cliff – project consent given in 2004. BSPB and other NGOs (including the Balkani Wildlife Society, Bulgarian Herpetological Society and Nature Protection Society – Varna) are currently appealing to the Bulgarian Supreme court against the change to the land use plan which could enable the project to be constructed
- Universum Energy Ltd. – 32 turbines between Kavarna town and Balgarevo village – consent given in June 2005, the NGOs are currently appealing against this consent in the Regional court
- INOS-1 Ltd – 35 turbines between Balgarevo village and the buffer zone of Cape Kaliakra nature reserve – consent given in June 2005, the NGOs are currently appealing against this consent in the Regional court. However, despite the outstanding court appeal the local land use plan has been changed to enable construction of the project and the Bulgarian Ministry of Energy has issued a licence for the project. There are very serious concerns that construction of this project is imminent and that damage may be caused before the appeal has been determined
- "Vertical-Petkov" – 3 turbines to the north west of the INOS-1 wind turbine park, consent given in June 2005, the NGOs are currently appealing against this consent in the Regional court

The basis of the appeals is the inadequacy of the EIAs and the fact that during the planning process the state authorities have ignored all information and up-to-date results of field surveys on the proposed location of the wind farms provided by BSPB/BirdLife Bulgaria and other NGOs and scientific institutions of the Bulgarian Academy of Sciences, including the results of the 2004 and 2005 BSPB migration studies summarized below.

In addition to the four projects discussed above, there are two large projects currently in the planning stages:

- Bulgarian Wind farms Ltd – 23 turbines – a public hearing on the EIA commenced in April 2006. Public pressure and the withdrawal of the initial statement by the Institute of Zoology resulted in the investor withdrawing its project application rather than risking a negative vote on its EIA. At present the investor is currently considering its position on this project, but it may be that a new application is submitted.
- Geopower Energy – 60 turbines in the north part of Kaliakra IBA currently undergoing EIA procedure after BSPB appeal against decision by Regional Inspectorate of Environment Varna to allow it without EIA procedure.

In addition, the NGOs are aware that further projects are being planned in the part of Kaliakra IBA north west of the Cape Kaliakra strict reserve.

In total, over 300 wind turbines have been consented in the North East Bulgaria/coastal Dobrudga region, including the 96 turbines within Kaliakra IBA, which indicates the scale of wind development planned in this sensitive coastal region.

2.3. Organization of the expertise

From 22nd to 27th of August 2006 the proposed sites for the wind farms mentioned above were inspected. The birdwatch count-sites of the BSPB within the Kaliakra area as well as in the further surrounding were inspected. Data from the observation counts of autumn 2004 and 2005 were received from the BSPB, and discussed together. Additionaly, the migratory situation was discussed independently with researchers from the Institute of Zoology, Sofia – Bulgarian Acadamy of Science.

3. Analysis of the potential impact

3.1. Migratory flyway

The data collected by the BSPB (National Ornithological Data Base with the BSPB) comprise roughly 17'000 observations in autumn 2004 (9.8.-31.10.) including 660'000 birds, 3'000 observations with 30'000 birds in spring 2005 (1.4.-31.5.), and 19'000 observations with 630'000 birds in autumn 2005 (1.8.-31.10.). BSPB are currently collecting data for autumn 2006. During the recent visit the passage of about 100'000 White Storks was reported by the bird observers within a few days, and at least some of them were seen during the visit. The figures above mainly include the large diurnal migratory species, such as storks, pelicans, egrets and raptors. The number of birds counted are well within the numbers expected according to observations further south (Porter and Willis 1968), and according to the limited funding and manpower the coverage of the survey is restricted to the most important areas, thus, the presented results must be regarded as a conservative estimate of the real passage. For details see the report of BSPB (Kostadinova, 2005; Deriev & Ruskov, 2005). There are no consistent observations of other migratory birds, such as diurnal passerines or nocturnal migration in general, however in general the numbers of diurnal passerines and nocturnal migrantsgreatly outnumbers the numbers of birds recorded during diurnal migration.

Unfortunately, long term upper air wind data were not available within the limited time left. Nevertheless, short term surface data show a clear dominance of northerly and north-westerly winds (figure 1). With respect to general large scale movement of high and low pressure centers, north-westerly winds should be the dominating on a long term. Under the influence of north-westerly winds, bird migrants coming from the north are getting more and more concentrated along the coast towards the south, which is confirmed by the huge numbers of migrants counted over more than 20 years at the stopover site further south in the area of Burgas (Meine, 1998; Zalles & Bildstein, 2000, Heath & Evans, 2000) and when crossing the Bosphorus (Porter and Willis 1968).

Based on the recent knowledge, we must assume that the intense bird migration across north-western Bulgaria gets strongly concentrated frequently along the Bulgarian Black Sea coast under the influence of north-westerly winds. While this is supported by the diurnal observations, no data is available for the nocturnal migration.

3.2. Local concentration

The visit at the cape Kaliakra together with inspecting the large scale topographical situation made clear that this is one of the first points where soaring migrants on their autumn migration are concentrated considerably. As pointed out above, this concentration occurs mainly with north-westerly winds. With these winds birds arriving at cape Kaliakra are pushed out to the sea. Under such conditions soaring birds are blown off the coast, together with the rising air in the thermals. However, when reaching the top of the thermal they try to glide back towards the land (Meyer *et al.* 2000). This behavour increases the local concentration, as many birds fly back and forth between the sea and the land, before they either succeed to move on or they land on the ground to wait for better flight conditions. Obviously, this kind of flight movements coincides with relatively low flight altitudes. Such flight behaviour, mainly of White Storks, is documented for several cases by the bird observers at the Kaliakra site. The frequent landing and roosting of several thousands of White Storks is well reported by the local population.

For the nocturnal migration we have no data and can only assume that birds behave as they do at other similar locations. A radar survey at the southern coast of Spain, showed that the majority of nocturnal migrants changed direction from SSW to W to avoid crossing the coast (Bruderer and Liechti 1998), leading to an increase of migratory intensity along the coast. With respect to flight altitude, we only can assume that birds avoiding crossing the sea and sometimes having to fly against the wind, tend to fly low, less than 100m above ground, where winds are generally weaker than higher up. In particular, the area of the Kaliakra steppes is reported as one of the largest autumn migration concentrations of the nocturnally migrating Corncrake (Delov & Petkov, 2002).

3.3. Specific aspects of flight behaviour

There is strong evidence that huge concentrations of soaring birds are present under north-westerly winds at the Kaliakra site. Under these circumstance the soaring birds are forced to switch from soaring-gliding flight to flapping flight, which involves large energetical costs, mainly for the large birds Pennycuick (1989). Addtionally, storks in flapping flight have a reduced manoeuverability, due to their limited power output and are observed in several occasions to collide with structures even easily visible to them. Therefore, we must consider that huge numbers of migratory birds will be within the area of the proposed Kaliakra windfarms, either roosting or flying within the height of the turbines. Many of them will be exhausted and restricted in their flight manoeuvrability. This specific behaviour created by the particularity of the Kaliakra site would lead to an extended exposure of the individual birds to the potential threat caused by wind turbines.

4. Risk assessment for migratory birds

Based on the available information for the Kaliakra site it is impossible to give absolute figures for the potential of collision risks due to the planned turbines. Nevertheless, the analysis of the available information together with the current knowledge on flight behaviour made clear that mass killing of a species like the White Stork could occur regularly. A high collision risk also occurs for nocturnal migration. Very high collision rates may arise in nights with low visibility, when the constructions on the ground are illuminated and therefore nocturnal migrants are attracted towards the constructions. However, as no data on the frequency of such weather conditions and the intensity of nocturnal migration at this site are available this remains speculative.

It must be mentioned, that to my knowledge there is no existing windfarm within Europe constructed or planned to be constructed at a site as Kaliakra with such a high density of soaring birds and with such a high risk for collisions. We must be aware, that not only the turbines, but also the additional tall structures (e.g. power lines) going along with the construction of wind turbines have a high potential for additional collision risks.

It might emerge that even such high collision risks would not cause a significant decrease in migratory bird populations. But, it has to be considered that migratory birds have to overcome several man made mortality risks along their flyway and it rarely can be verified that a single threat causes the crucial decrease in a whole population. Therefore, it must be considered that if a site like Kaliakra with such a high potential of threat is accepted, many other sites with lower risks have to be accepted too.

Undoubtly, such a development could be disatrous for the bird populations migrating along the flyway of the western Black sea coast.

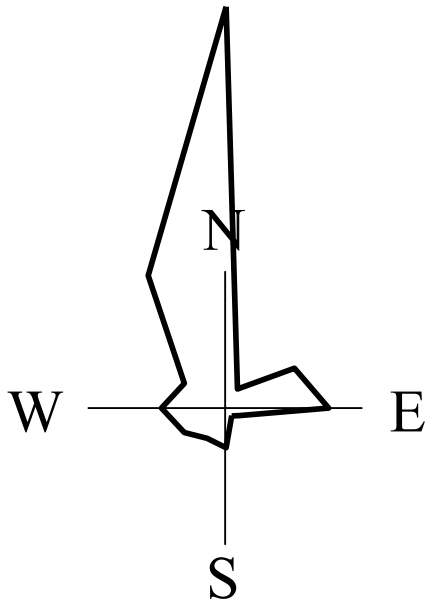
5. Recommendations

Based on the analysis above, I strongly recommend to withdraw all the current projects within the area of the Kaliakra IBA/proposed SPA. Clearly, renewable energy can contribute considerably to the conservation of nature, by reducing the effect of man made climate change. But, without being an expert in renewable wind production, it seems likely that the small potential loss in energy production, due to choosing a site more inland, would be at least balanced by the increased safety of the migratory birds along one of the worldwide most important flyways, and thus would be a significant contribution to support biodiversity.

Based on the information from BSPB/RSPB and BirdLife International (see above section 2.2), I must assume that the EIA's presented for the different projects did not take into account the fact that the proposed sites are at least potentially within an important flyway of bird migration, and they did not collect appropriate data nor consider existing data to provide a reliable risk assessment. More elaborated recommendations would only be possible if considerably more information on bird migration are available for the proposed sites. The mentioned EIA's seem to be far from the acknowledged standards within the EU. With respect to the aspect of birds there should be at least:

- a full year ground survey on diurnal bird migration, breeding and wintering birds.
- a representative sample collected on density and flight altitude of nocturnal migration in spring and autumn (several weeks).
- an estimate of collision risk.
- a comparison of benefits and costs in terms of natural goods with alternative sites.

Figure 1: Frequency of surface wind directions at Kaliakra from Aug to Oct 2005.



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