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CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE
AND NATURAL HABITATS

Standing Committee
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**On-the-spot appraisal
to a projected wind farm plant
near Balchik (Bulgaria)**

Report of the on-the-spot appraisal

(Sofia, Varna, Balchik, 26-30 September 2005)

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1. INTRODUCTION

1.1. Energy, the general context

With the perspective, during the coming century, of a decline in resources of fossil energy and even total exhaustion of some, faced with an increasing world demand and the continued technological and safety difficulties inclusive of nuclear energy and the ever increasing rate of atmospheric pollution by greenhouse gases which we now know contribute to a seriously and long lastingly disrupted climate; the development of clean techniques for harvesting renewable energy sources is a present must. It constitutes a means of replacing every rarer and more expensive fossil energy resources and a reduction in the emission of greenhouse gases. This approach is part of the putting into practise of the Kyoto protocol.

On the 27th September 2001 the European Union adopted a directive (2001/77/CE) aiming to promote a significant use of renewable energy sources in defining a certain number of objectives to be achieved by 2010. These measures included, amongst others, production of electricity from sustainable energy. Wind farms are an integral part of them.

In general, the use of wind farms to produce electricity is largely accepted by the full cross-section of society. .

1.2. The Bulgarian Wind Farm policy.

In this context, the Bulgarian government has fixed its aims at producing, by 2012, 10 % of its electricity by harvesting the wind.

The construction of a wind farm near the town of Balchik, near Varna, on the shores of the Black Sea, is one of the flagship projects, within this national policy.

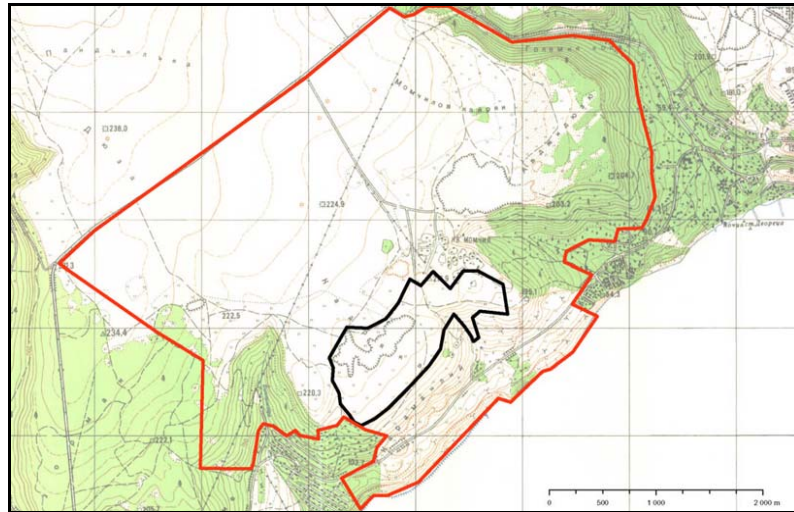
2. THE WIND FARM PROJECT AT BALCHIK

2.1. Geographic and landscape characteristics of the proposed wind farm site

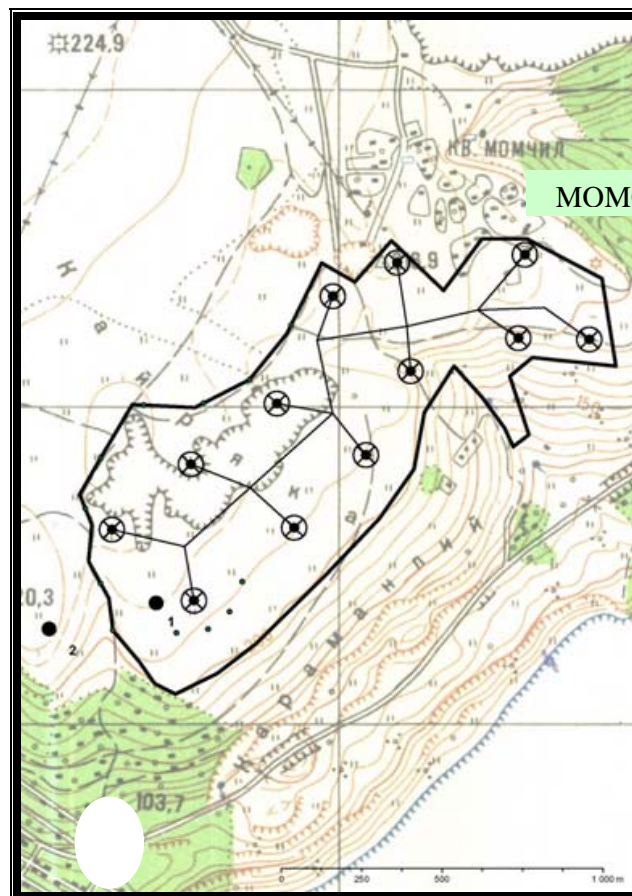
The area retained for the wind farm construction is close to the town of Balchik. The exact site, covering some 110 hectares is on a limestone plateau with its highest point at 230 metres altitude. It's close to Momchil, a small village of some 50 inhabitants, on the side of a quite steep escarpment separating the plateau from the Black Sea shore. The wind farm would be some 600 metres from the nearest houses in Momchil. The resort town of Albena to the south is about 2 kilometres away. There's a military transmission installation on the plateau; a small low building next to an antenna, its height isn't given in the documents provided.



Map 1: Location of the site of the wind farm plant project in the vicinity of Balchik



Map 2: Location of the Balchik wind farm project (From a Bulgarian Society for the Protection of Birds complaint document) Proposed site (red line—larger polygon) and the planned wind farm Phase I (black line—smaller polygon).



Map 3: Area of the proposed Balchik wind farm and location of the twelve turbines in Phase I as defined in the technical plan.



Picture 1: View of the plant project site.



Picture 2: The small village of Momchil with abandoned farms situated to the north of the site.



Picture 3: View from the southern edge of the plateau over the Albena tourist complex.



Picture 4: Toward the north-east, view on the Black Sea coast.

2.2. Techniques characteristics

The Environmental Impact Assessment (EIA) document indicates a provision for the construction of 24 wind turbines in two phases of 12 turbines each. However, the EIA only concerns itself with the site of the first set of twelve. The site has been chosen for two main reasons. The first is for the amount of wind which is judged particularly interesting on the plateau thanks to its altitude, the second the fact that the company TESSA ENERGY OOD owns the site.

2.3. The different steps in the setting-up of the project

2.3.1. The Environmental Impact Assessment (EIA)

The EIA report was taken as far as a public enquiry in May 2003.

The wind farm would be built on the plateau, avoiding valleys and depressions. The report states that the turbines will be built on 64 metre high masts topped by a three blade rotor 72 metres wide. The surface covered by the blades would be 4 072 square metres. The total height of each turbine isn't given in the report, but would normally be about 135 metres.

During optimum conditions, the rotors would do 17.3 revolutions /minute. The cables carrying the power to the distribution network would be underground on site then connected to an overhead network. A two storey operation station would be built as well as some low annex buildings.

The shortest distance from turbine to inhabited building would be 550 metres. The predominant winds are from the north, north-east and north-west.

This project proposes no alternative site, the motive being that the company TESSA ENERGY OOD owns the project site "Taking into account the fact that the Investor owns only this lot, at present there are no alternative locations for construction of the wind power station".

The proposed installations would cover a total of some 20,000 square metres, some 2187 square metres for the turbines; there would be about 360 metres between each turbine.

An initial botanical study of the site showed the flora to lack any rare or threatened species.

The results of an inventory (using a qualitative and non quantitative list) mentions 1 species of amphibian, 9 reptiles, 65 birds of which 30 were from the surrounding area and 13 species breeding on the site, the others overwinter, are migrants or erratic, and 6 species of mammals.

The « Via Pontica » is mentioned in the following terms: « Such species diversity is relatively low, although the site is in proximity to the Via Pontica migration route; this is due to the monotonous character of the biotope ».

Paragraph 3.8.2.4. entitled "Forecast impact on the fauna" concludes that the impact of the wind farm on birds would be "insignificant compared to those elsewhere in the country, and are therefore not vital to the preservation of species" and adds in respect to migrant and nesting species "that there is no definitive evidence that wind power station impact adversely nesting and migrating birds; on the contrary, new habitats for some species are created". Considering migrants, it is stated that "observations show that the average flight height near the wind turbines is above 100 m, while in other adjacent regions it is 60 m". Further in the report is written "the soaring birds fly at a considerable height (200-300m) outside the site... Small flocks of song birds try to fly across the site or very near it... Due to strong winds characterizing the region, most of the observed birds flew to the sides of the site.

The results from the basic monitoring will be used to plan the impact monitoring after the wind power station is built". And further it is added "During the basic monitoring, storks were the only bird species listed in the table and sensitive to wind turbines. They, however, do not fly over the site, but come from the south along the seashore and near the Batova river go straight north, away from the plateau. Individual specimens of (pink ?) white pelicans have been seen to fly over the sea, east of the site, and in the region of Balchik they turn to the north-west".

Among some of the measures proposed, are:

- to decrease the visual contrast between the wind turbines and the background (sky) they should be painted in grey tones.
- The turbine blades must be painted with an anti-reflective coating in order to avoid light reflections from the blades.
- Where possible, construction and assembly work is to be performed outside the birds' breeding season (May and the first half of June), so that they are not disturbed by the noise of machines while brooding or rearing young in the nest.
- Impact monitoring planned on the basis of the results from the basic monitoring of birds in the region is to be conducted in order to assess the possible impact of the wind power station on those birds.

About the "status of the birds in the region of the wind farm – the assignment for impact monitoring of the avifauna will be prepared on the basis of the results from the basic monitoring conducted during the period 28.02.2003-31.03.2004."

The conclusions of the Environmental Impact Assessment Report are the following: "The assessed investment proposal for constructing Wind farm for electricity generation - Wind power station in the

land-use area of the town of Balchik, feasibility study phase, was developed to the required amount of detail and as a whole corresponds to environmental protection and sanitary norms”

“On the basis of the environmental impact assessment, the EIA report authors proposed that the Expert Environmental Council approve the implementation of the investment proposal for construction of “Wind park for electricity generation - Wind power station in the land-use area of the town of Balchik”, the investor being “TESSA ENERGY” OOD.”

2.3.2. Complaint by the Bulgarian Society for the Protection of Birds against the project to the Bern Convention secretariat

During the public enquiry, the Bulgarian Society for the Protection of Birds (BSPB) expressed serious doubts about the contents of the E.I.A., underlining 23 points of disagreement or criticism in a document dated the 23 June 2003.

Here, we take into account only a few of these, those pertaining to our expertise assignment.

These reservations and criticisms concern the quality of the botanical study that is considered insufficiently documented, particularly as regards three species in the Bulgaria Red Book being ignored (*Goniolimon tataricum*, *Goniolimon collinum* and *Koeleria brevis*).

The BSPB notes that some habitat types it considers to be on the Balchik site haven’t been taken into account and which should be protected according to measures within the European Habitat Directive.

It shows that work linked with the erection of the wind farm could seriously harm the habitats, the flora and other species directly linked with the site.

It underlines that risks of the turbines to migrant birds have been incorrectly estimated, specifying that electricity power lines on the coast between Albena and Kaliakra are lethal, especially for Corn crane (*Crex crex*).

It considers that work on mammals and amphibians was insufficient, stating that two species threatened with extinction probably occur on the site: the Romanian Hamster (*Mesocricetus newtoni*) and the Marbled Polecat (*Vormela peregusna*).

It also indicates the presence, cited in the EIA, of two vulnerable species: the Greek Tortoise *Testudo graeca* and the Lesser Mole Rat *Nannospalax leucodon* and insisting on the fact that the risk of birds or bats colliding with the turbines is underestimated.

It states that the planned site for the project is on the “Via Pontica”, an important flyway for migrant birds, citing the large number of soaring birds counted on the same flyway at a site at Lake Atanassovsko.

It also estimates that the over wintering of 250 000 geese in the region, including the Globally endangered Red Breasted Goose (*Branta ruficollis*) which is the object of an international action plan, and which might cross the site, hasn’t been sufficiently studied.

It insists on the fact that the building of this wind farm would be in strict violation of two international conventions, the Bonn Convention (on migratory species) and the Bern Convention (for the protection of the European Wild Flora and Fauna).

Lastly, it asks for the publication of all the results of impact studies concerning the site which are missing (at the time this note is being written).

In its complaint to the Conservation of European Wildlife and Natural Habitats secretariat (Bern Convention), the BSPB uses many of the arguments concerning habitats and the fauna and flora already developed in its document written after consulting the EIA’s contents.

The BSPB underlines the fact that if the wind farm is built, the turbines will pose an important threat to thousands of soaring migrant birds using the Via Pontica flyway, and importantly the following Globally Threatened Species: Dalmatian Pelican, Red-breasted Goose, Greater Spotted Eagle, Imperial Eagle, Lesser Kestrel, and nearly Globally Threatened Species such as Pygmy Cormorant, White-tailed Eagle, Pallid Harrier; and also on White Stork, Black Stork and White Pelican.

The BSPB states that it has censused 129 bird species there, mainly migrant and over-wintering species.

The number of birds counted during the post-breeding migration over the proposed site or its southern edge was particularly high : 88 000 Storks, 9 000 pelicans and 7000 birds of prey of which 1/3 flew over the project site at a height of between 40 et 120 metres. That's to say within the height covered by the turbines of the proposed wind farm.

The principal criticisms expressed against the EIA report are about the part concerning birds. The BSPB draws attention to the fact that the report only covers the period 1st March to 21st April, but should have covered 12 months thus studying and analysing the birds' biology over the whole year. The methods used are judged inadequate and the ornithologists concerned poorly qualified for such a study.

The part of the EIA concerned with the risk of collisions is considered little researched and treated superficially.

It indicates that the BSPB ornithologists studied the succession of the post-nuptial migration during 68 consecutive days (as against 9 days of data for the EIA report) and thus showed that more species are concerned than stated in the EIA and in greater numbers.

This complaint indicates that a complementary report on birds, asked for by the company TESSA ENERGY OOD and done by the experts involved in the impact study, was provided after the inquiry.

In spite of the very short delay, the BSPB sent a report on migratory birds to the Bulgarian authorities. However, this report didn't influence the decision to allow the wind farm construction.

In conclusion in its complaint, the BSPB asks

- 1) the Bulgarian government to take its bird migration report into account,
- 2) that the company TESSA ENERGY OOD proposes an alternative site to the one at Balchik,
- 3) that future environmental impact studies should be more thorough,
- 4) that the policy on wind farm construction should be more respectful of the environment and their choice based on a common consensus,
- 5) that faunal impact studies for EIAs should be undertaken over 12 months,
- 6) wherever wind farm developments take place in potentially sensitive areas, proper independent monitoring schemes on the environmental impact should be undertaken, and expert NGOs should have a prominent role in this,
- 7) that all areas that qualify as sites in the Emerald/Natura 2000 network should be adequately protected within the pre-accession period, as well as afterwards, according to the requirements of the Birds and Habitat Directives to avoid any deterioration and to protect their natural values.

2.3.3. Complementary report on birds studied at Balchik

Because the EIA document was considered insufficiently researched concerning birds, a supplementary report was produced by Professor Dimiter NANKINOV after the public enquiry. It appeared on 9th July 2003, available for the public debate.

This time of the ornithological census period in the field was proposed as being between February 2003 and March 2004 (from 28/02/2003 to 31/03/2004 as announced in the EIA report). But data in the report only cover the period from mid February to early July 2003. The contents of this document were reproduced in the TESSA ENERGY OOD company report dated 22/8/2003 and was prepared D. NANKINOV. This report, more detailed than that of 9th July has evidently included amendments and additions. So we will refer to this document.

A first table lists 94 bird species censused during the study with their biological and legal status. A second table has the same species giving numbers censused. A third lists gives daily counts obtained over the 16 days of watching migration, from 6th April 2003 to 26th May 2003 without giving details of the species concerned.

The principal conclusions of this new report are the following:

Of the 94 species observed during spring migration near Balchik, 39 were actually on the site and 7 of these breed there –population estimates per species aren't given.

In this new census there's, one species of amphibian (the same species as in the previous EIA report), 5 species of reptile (9 in the previous EIA report), 8 species of mammals (6 in the previous report).

Most of the nests investigated by the ornithologists were later predated, presumably by ground predators.

During their migration the birds (Storks, Cranes, and White Pelicans) either fly over the site at a great height, or fly round it because of its relief and strong winds typical at this time of year.

Passerines avoid the strong wind by flying low and following natural depressions. In light winds birds cross the site.

In June, the site is visited by gulls, sparrows, starlings and other species searching for food.

A waste dump near the site attracts birds (high concentrations).

The report author indicates that each site has its own particularities and thus it's difficult to apply to this site risk and mortality studies made elsewhere.

Of risks, the author states that low numbers of birds pass over this site compared to others, that only 12 species (120 individuals during the study period) that fly over the site were species susceptible to colliding with turbines. Many birds fly very low and thus pass under the turbines.

This report indicates a turbine blade length of 80 metres, whereas this is given as 72 metres in the EIA report.

Concerning the risk of bird fatalities, references to work undertaken elsewhere is examined and discussed.

The conclusions on the risk of bird fatalities in this new report are as follows:

- 1- No species listed in the literature as being risk species cross the proposed wind farm site; the maximum number of any species was 120 individuals.
- 2- The impact of the construction of the wind farm would be mainly of disturbance, nest destruction. It is estimated that about half of the breeding population would move to the site boundaries.
- 3- That gulls would be disturbed by the turbines.
- 4- That on present knowledge acquired during spring and summer monitoring, there is no reason for suspecting any other type of impact.

2.3.4. The Official decision on the Environmental Assessment by the Regional inspectorate of the Ministry of Environment and Waters of Varna

On October 27th 2003, the regional inspectorate of the Ministry of Environment and Water of Varna took the decision (N°.2981 / 27.10.2003) to approve the Environmental Impact Assessment for settlement of the "Wind park for electricity generation Wind energy, 1st stage" in lot N° 000287 in the land-use area of the town of Balchik, investor : Tessa Energy OOD"

This decision has been submitted to 19 constraints points; those which have been considered important in regard to our report are connected with the conservation of the wildlife and the natural habitats. The most important parts of these measures have been printed in bold types.

Point 3: no plans should be made for the construction and the location of any facilities in the region of **the registered deposit of decorative lime « Momchil ».**

Point 4: when determining the location of the generators, priority should be given to the technical possibilities and the expediency of situating them **along the prevailing direction of bird migration, north-south.**

Point 7: provisions should be made for devices **preventing the birds from perching on the power line** connecting the substation and the national grid.

Point 8: the wind turbines should be **painted in grey tones** and the blades-in **anti reflective surface coating** in order to limit the visual impact and to prevent light reflection and discomfort to humans.

Point 9: the **fences (nets) must ensure unimpeded movements of animals** (turtles, hares, etc.).

Point 14: construction work **should not be conducted during the birds breeding period** (May and the first half of June).

Point 16: where the results referred to in above exceed the norms, a **special regime of operation of the turbines** approved by RIEW-Varna should be introduced, taking into account the days **with peak migration of birds** shown by the monitoring.

Point 19: after commissioning the current basic ornithological monitoring of the site **should be completed and subsequent monitoring should be conducted during the autumn and spring migration of birds**. A report of the outcomes which includes, where necessary, mitigating measures, should be drawn up. The intermediate report and the final report must be submitted to RIEW-Varna within one month of the completion of each stage, but no later than one year of commissioning.

2.3.5. The Bern Convention secretariats decision for an expert assessment in Bulgaria

Further to the complaint lodged by the Bulgarian Society for the Protection of Birds against the plant project of a wind farm at Balchik - Bulgaria, to the Bern Convention secretariat, the Bureau of the Standing Committee recognised this complaint.

The Bulgarian government, aware of the criticisms of the EIA report decided that a visit, to the actual site, of a team of experts, acting for the Berne Convention secretariat would be the best solution.

During the meeting on 8th April 2005, the office of the Permanent Committee replied favourably to this invitation.

We were officially named as expert the 7th September 2005, our visit to Bulgaria was programmed for the 27th to 29th September 2005.

3. ORGANISATION OF THE ASSESSMENT

3.1. Framework for the assessment

Our objective as defined by the Convention Secretary General is study the proposed building of a wind farm near Balchik, on the banks of the Black Sea, on the *Via Pontica* flyway, taking into account work done on wind farms by the Permanent Committee.

We have thus been called upon to:

- analyse the wind farm construction project,
- investigate the proposed site and if necessary propose alternatives,
- evaluate the foreseeable impact from the ecological and landscape viewpoint,
- meet with relative authorities and other concerned actors,
- And finally make appropriate recommendations to the Bulgarian government.

The results of this mission will be given in a report to be presented to the Standing Committee (28 November – 1 December 2005).

3.2. Sequence of events

The expert, ourselves, was accompanied by the visit organizer, Mrs Françoise BAUER from the Natural Heritage and Biological Diversity Division – Convention of the Conservation of European Wildlife and Natural Habitats.

The program of our visit to Bulgaria as well as its organisation was handled by Mrs Rayna HARDALOVA, directory of the National Office for Nature Protection – Ministry of Environment and Water –SOFIA.

On 27th September, a meeting was organised during the morning at the Ministry of Environment and Water in Sofia : under the presidency of Mister Hristo BOJINOV Director of the National Nature Protection Service Division in the form of a round table to which all those implicated in the wind construction at Baltic were invited. We were then received by Mr Yordan DARDOV, Vice-Minister of Environment and Water.

During the afternoon and early evening we travelled by road to Varna

On 28th September, a first meeting with Mrs Teodora KARAIVANNOVA, director of the Regional Inspectorate of the Ministry of Environment and Water in Varna, followed by a closed meeting. Before a new round table at the start of the afternoon bringing together most national and local representatives to examine documents concerned with the Balchik project and discuss them, we were able to consult various documents that we hadn't known of before then.

On 29th September, the morning was taken up by a visit to the Balchik site and the observation of bird migration there.

On 30th September, a new meeting with Mrs Teodora KARAIVANNOVA, in order to ask for permission to go to the Balchik site at nightfall so that we could listen for nocturnal bird migration. Permission was accorded.

3.2.1. Round Table at the Ministry of Environment and Water at Sofia

The round table, bringing together 18 people, took place in Ministry of Environment and Water buildings under the presidency of Mr Hristo BOJINOV, director of Nature Protection. During presentations of those present, the Berne Convention delegation representative, Mrs F. BAUER, defined the framework of our mission.

After having presented the contents of the Balchik wind farm construction project *Après* and the general energy policy of which it is part, Mr Hristo BOJINOV ran through the different steps that led to the project being accepted. He went through the criticisms and debate that this project had aroused.

He underlined the fact that, within the perspective of Bulgaria's entry into the European Union in 2007, the transfer to internal law of legislature, especially concerned with the Birds and Habitats directives, had been accomplished. The precepts contained within the Convention of the Conservation of European Wildlife on Natural Habitats had been taken into account in Bulgarian laws and legislation.

He also indicated that the administrative procedure had been respected.

During the discussions, the Bulgarian Society for the Protection of Birds representatives spoke of their criticism of the contents of the impact study, judging it bias. Incomplete and complaisant as far as risks to birds was concerned. They recalled that the proposed wind farm site was on the *Via Pontica* flyway. This flyway is used by 300 000 soaring birds within the overall probable total of 5 million migrant birds.

The director stated that he had total confidence in his official experts.

He invited the Berne Convention delegation members to continue with their mission at Varna in order to evaluate the situation, including in the field.

The director restated that he would do everything in his power to help with our mission.

During our meeting with the Vice Minister of Environment and Water, Mrs Françoise BAUER explained the aim of our mission and our role as experts.

The Vice Minister also assured us, that were possible his service would provided anything we needed to better fulfil our mission.

We were officially given a file including the Environment Impact Assessment approval decision, the EIA summary and two documents including the expert's, Mr.D. KIUCHUKOV, conclusions.

3.2.2. Working meetings at Varna

During our meeting with Mrs Teodora KARAIIVANOVA, the Regional Inspectorate of the Ministry of Environment and Water director, and her colleagues, on the morning of 28th September, we were informed in length of the different steps in the administrative procedure concerning Wind Farm plant project at Balchik. Public consultations aiming at better knowledge on the characteristics of the project and meetings to alleviate conflicts were organised. We were shown the contents of complaints of the project that were received and the legislative procedures that followed, in Bulgaria.

The second part of the day was given over to looking at administrative documents including the report of the Environment Impact Assessment that we saw for the first time.

The meeting in the afternoon was also held in regional directorate buildings, brought together the administrative personnel in charge of the project, representatives of the TESSA ENERGY company, various people of the impact study research team, and representatives of the Bulgarian Society for the Protection of Birds (BSPB).

A quick discussion allowed for many technical points of the wind farm project to be clarified, of the various steps in acquiring information of the site, including Professor Dimiter NANKINOV's report, already referred to above. The views of NGOs unfavourable to the project were heard.

We also asked for more details on points that we found unclear.

Oposing points of view were calmly expressed. Everybody was conscious that this project would be an example having an impact on future projects of this type.

Stating our needs for information, particularly official documents such as the EIA report, we were promised that they would be translated from Bulgarian to English and that we would receive them as soon as possible. This latter proved to be the case.

At the end of the meeting, the BSPB gave us a report on bird observations made between August and October 2004 at the Balchik site.

3.2.3. Diurnal field visit

The morning of 29 September 2005 from 8h onwards, we visited the proposed wind farm site near Momchil village, close to the town of Balchik.

The group consisted of Mrs Hristina GUENOVA, chief of the Biological Diversity and Protected Area department, Mr Nikolay NEDIALKOV, expert and a fellow worker, Mrs Rayna HARDALOVA from MEW of Sofia, Mr Lyudmil IKONOMOV general manager of Geopont-Intercom, the delegate of the Society Tessa Energy, Dr Petar IANKOV of the BSPB, Mrs Françoise BAUER and ourselves.

The sky was clear with a few stratus clouds. A steady wind of about 40 km/h was blowing from the northern quarter. The temperature was slightly below 15 ° C.

On leaving Varna, at around 7h until our arrival at Momchil, passerine migration, mainly of White Wagtails *Motacilla alba* in succeeding large flocks was visible from the coast road that we had taken.

At the Momchil site, many birds were on the ground in the low vegetation: Skylarks (*Alauda arvensis*) (more than 100), Crested Larks (*Galerida cristata*) (some), Calandra Larks (*Melanocorypha calandra*) (4), Red-throated Pipits (*Anthus cervinus*) (4), Quails (*Coturnix coturnix*) (2), Northern Wheatears (*Oenanthe oenanthe*), Pied Wheatears (*Oenanthe pleschanka*) (2), Black-eared Wheatears (*Oenanthe hispanica*) (2). As well as proof of Eagle Owl (*Bubo bubo*) being present, with one flight feather found on the ground.

What was left of a White Stork's wing found near the military antenna shows that storks fly over the site, and that some perish?

Passerine migration occurs on the plateau at a very low level (from a few metres to tens of metres above the ground) and along the coastal slope. The main species concerned were: Swallow (*Hirundo rustica*), White Wagtail (*Motacilla alba*) and Chaffinch (*Fringilla coelebs*).

Just after our arrival Sparrowhawks (*Accipiter nisus*) and then Levant Sparrowhawks (*Accipiter brevipes*) passed singly hugging the ground. Later in the morning, as temperatures rose, raptor passage

increased. We noted that the main *Via Pontica* migratory flow is very compressed before passing above the town of Balchik, and tends to spread out again on arrival on the Momchil plateau. Flocks of passerines also migrated along the coastal slopes, flying over the new village of Momchil, with its weekend homes and the village of Izgrev, as well as over the plateau including over the proposed wind farm site, whereas other flocks took a more westerly line over agricultural land.

Raptors passed low over the project site but many opted to pass farther west over agricultural land and then woodland on the southern slopes of the plateau, without doubt due to their dark colour and resulting thermals. Flight altitude increased steadily from a few tens of metres above ground to about 200-300 metres, birds steering towards Albena. The closer we came to midday, the more the temperature rose and with it the height of raptor passage. Nonetheless, throughout the morning more than 300 birds (raptors and passerines) were seen migrating at less than 50 metres above the project site. During our presence, there was heavy sparrowhawk migration with flight height staying between low and very. Raptor species seen flying very low and crossing the project site were: Sparrowhawk (*Accipiter nisus*), Levant Sparrowhawk (*Accipiter brevipes*), Goshawk (*Accipiter gentilis*), Buzzard (*Buteo buteo*), Lesser Spotted Eagle (*Aquila pomarina*) and Marsh Harrier (*Circus aeruginosus*).

Other species seen close to the site included:

Short toed Eagle (*Circaetus gallicus*), Roller (*Coracias garrulus*), Alpine Swift (*Apus melba*), Woodlark (*Lullula arborea*) and Red-backed Shrike (*Lanius collurio*),

Very fortuitously, we found a Common Tree Frog (*Hyla arborea*) during our visit, adding a new species of amphibian to the site list.

3.2.4. Nocturnal field visit

Following our request to Mrs. Karaivanova to be able to make a nocturnal visit to the site, two people from the regional inspectorate accepted to take us to the Balchik site during the early part of the night to verify audibly if there was active nocturnal migration.

Arriving on site at 21 h 30, we listened for bird calls until 23 h. Our listening position was pinpointed using GPS: 43° 23' 32'' N / 28° 06' 30'' E.

In almost total silence, we listen to the calls of migrating birds, counting them in 5 minute periods after having identified the species concerned.

At the start of the operation, there was thick, low cloud cover with a few open patches. There was a slight breeze from the north-east. From 22h onwards, the breeze slackened to stop around 22h30 by which time the sky was totally clear. The temperature was near 20°C.

Results : calls of 1 Grey Heron *Ardea cinerea*, 1 Dotterel *Charadrius morinellus*, 3 Robin *Erithacus rubecula*, 5 Song Thrush *Turdus philomelos*, 2 warblers (probably Blackcap *Sylvia atricapilla*) and 1 Spotted Flycatcher *Muscicapa striata*.

It is important to note here that birds on nocturnal migration don't necessarily call. A call that is heard could correspond to one or several birds. Calls of passerines are often heard in isolation. Migration calls of passerines don't carry far, those of birds such as Grey Heron or Dotterel will carry farther. Due to this, most birds that are heard will be no more than 100 metres distant.

From this very short visit, we can confirm that the proposed wind farm site is crossed by birds on nocturnal migration.

Access track to the site, and those actually on the site, probably because of the mild weather, were dotted with Green Toads in incredible concentrations.

3.3. Document access

3.3.1. Different stages in the provision of documents

The administrative documents, reports and notes necessary for our assessment, were provided by the Berne Convention secretariat before our mission took place, by the Ministry for the Environment and Water during our mission and in the days following and by the BSPB during our mission.

3.3.2. List of documents provided

3.3.2.1. *List of documents sent by the Directorate of Culture and Natural Heritage, Secretariat of the Convention on the Conservation of European Wildlife and Natural Habitats – COUNCIL OF EUROPE*

1. Windfarms and Birds: An analysis of the effect of windfarms on birds, and guidance on environmental assessment criteria and site selection issues. Report by BirdLife international on behalf of the Bern Convention. **Standing Committee.** 23rd meeting, Strasbourg, 1-4 December 2003. T-PSV/Inf (2003) 12.

2. Projet de Recommandation sur l'atténuation des nuisances de la production d'énergie éolienne sur les oiseaux et les chauves souris. Comité Permanent. 24^{ème} réunion, Strasbourg, 29 Novembre - 3 Décembre 2004 . T-PVS (2004) 4.

3. Possible New File : Construction of the Balchik wind farm (Bulgaria). Standing Committee. 24th meeting, 29 november – 3 December 2004, T-PVS/Files (2004) 6

4. Rapport. Comité Permanent. 24^{ème} réunion, Strasbourg, 29 Novembre - 3 Décembre 2004 . T-PVS (2004) 16.

5. Possible New File: Construction of the Balchik wind farm (Bulgaria) Standing Committee. 25th meeting, Strasbourg, 28 November-1 December 2005 . T-PVS/Files (2005) 5.

3.3.2.2. List of documents provided by the ministry of Environment and Water of the Republic of Bulgaria for the site visit: Wind Power Park – Balchik, Bulgaria, 26-30 september 2005

Xxxx – documents provided at the beginning of the visit

Xxxxx - documents provided in Varna

Xxxx – provided by e-mail

0. List of participants at the meeting in MoEW -27/09/2005

1. Environmental protection Act

2. Biodiversity Act

3. EIA Ordinance

4. Regulation for EIA

5. Bulgarian Energy Sector

5.a. Renewable sources

6. **Parts of the EIA Report** (including Contents)

6. a. EIA Report - **EXECUTIVE SUMMARY**

11. **The Protocol from public discussion**, 24th of July, 2003

13. STATEMENT regarding the questions raised during the public discussion of the EIA Report on the investment proposal “Wind Park for Electrical Power Generation – Wind Power Station, Ist Stage” held on July 24th, 2003

INTERMEDIATE RESULTS from ornithological research carried out during the spring and summer periods of 2003.

Replies to the questions raised in the letters of the representatives of owners of real estate situated close to the site where the investment proposal is envisaged to be realised.

13. 1.1. Letter by representatives of the owners of real estate in the “Izgrev” villa area.

Replies to the questions raised in the letters of opinion deposited by “Albena” AD and by the sub-agents of “Albena” AD:

13.2.1. Krassimir Stanev, Executive Director of “Albena” AD.

13.2.2. dipl. Eng. Iliya Petrov, Managing Director of ET "Iliya Petrov" (which is drafting a Plan for the management of the Preserved Reserve "Baltata" and its buffer zone).

13.2.2.a.Dr. Petar Stanislavov Shurulinkov – Institute of Zoology at the Bulgarian Academy of Sciences, team-member of the Plan for the management of the "Baltata" Preserved Reserve and its buffer zone.

13.2.3. Assc. Prof. Dr. El. Zheleva, head of the Bureau for environmental expert assessments at the Forestry Technical University (presently working on the topic "Assessment and forecast of the environmental conditions in the region of the river Batova water catchment basin").

13.2. 3. a. Sr.Rsch.Assc. 2nd dgr. Bogdan Bogdanov, Institute in Genetics - Bulgarian Academy of Sciences.

3. Replies to questions raised in the letters of opinion deposited by the Bulgarian Society for the Protection of Birds:

13. 3.1.Sergei Dereliev, Director of "Protection of Nature" at the Bulgarian Association for the Protection of Birds.

13. 3.2.Petko Kovachev, Executive Director of the Information and Education Centre on the Environment.

13. 3.3.Rsch. Assc., Dr. Teodora Ivanova, Coordinator of the Centre for Research and Protection of Bats at the Natural Science Museum – Bulgarian Academy of Sciences, Bulgaria's Representative at the Advisory Council of EUROBATS.

13. 3.4.Dimitar Georgiev, regional coordinator for the Bulgarian-Swiss Biodiversity Preservation Programme, the Bulgarian Foundation for Biodiversity.

13. 4. Intermediate results from the ornithological research carried out during the spring and the summer periods of 2003 in the vicinity and in the area of lot №000287 in the "Momchil" area, Municipality of Balchik.

14. Letter from TESSA ENERGY to RIEW-Varna (Ingoing number: 3820/22.8.2003) regarding the Opinion of Tessa Energy Ltd. on the issues, letters and opinions submitted during the public discussion of July 24th 2003 on the EIA report on the investment proposal for the construction of a wind electric power station in the municipality of Balchik, including the text of the Report on the Interim Results of the Spring-Summer Avifauna Monitoring (including 3 figures).

19. EXPERT CONCLUSION based on the documents available at the Regional Inspectorate for Environment and Waters – Varna on project site: "Wind park for electrical energy production – Wind energy unit – stage I" prepared by: Dipl. Eng. D. Kiuchukov.

22. Minutes No 3 (95)/2003 of a session of the Expert Council on Environment on 21.10.2003 at RIEW-Varna in regarding to EIA Decision of investment proposal **"Wind Park for Generation of Electric Power – Wind Energy Park, Stage 1" on lot No 000287 of the land-use area of the town of Balchik**, investor "Tessa Energy" Ltd.

22-Annex 1. Appendix No. 1 to the Record of Proceedings of the Ecologic Expert Council Meeting No. 3(95)/2003.

23. STATEMENT of the Bulgarian Society for the Protection of Birds/BirdLife Bulgaria to the Expert ecological council of RIEW – Varna on the construction of a wind turbine park west of Balchik based on the bird fauna in the area from 18 October 2003.

25. DECISION on environmental impact assessment No. 3 - 3(95) 2003 concerning investment proposal **"Wind Park for Generation of Electric Power – Wind Energy Park, Stage 1" on lot No 000287 of the land-use area of the town of Balchik**, investor "Tessa Energy" Ltd.

27. COMPLAINT from the **Bulgarian Society for the Protection of Birds (BSPB)**, against **Decision No 3-3(95) 2003** of the Director of RIEW-Varna concerning EIA of investment proposal **"Wind Park for Generation of Electric Power – Wind Energy Park, Stage 1" on lot No 000287 of the land-use area of the town of Balchik, Municipality Balchik.**

28. COMPLAINT from ALBENA LTD. – Resort Complex ALBENA against Decision on environment impact assessment No 3-3 (95) 2003 of the Director of RIEW-Varna

29. Letter Outgoing No: 3092/07.11.2003 from RIEW-Varna to the MoEW concerning Complaints against decision on EIA No 3-3 (95) 2003 of the Director of RIEW-Varna concerning investment project “Wind Park for Generation of Electric Power – Wind Energy Park, Stage 1” on lot No 000287 of the land-use area of the town of Balchik, Municipality Balchik: investor “TESSA ENERGY” Ltd.

30. Litigation from NGOs against Decision No 3-3(95) 2003 of the Director of RIEW-Varna.

31. Litigation from Albena Ltd. against Decision No 3-3(95) 2003 of the Director of RIEW-Varna.

32. Letter (Outg. No. 3258/26 November, 2003 to the **Varna District Court, Administrative Division Re.:** Appeal lodged by NGO-s against Decision on Environmental Impact Assessment No. 3-3(95) 2003 issued by the Regional Inspectorate for Environment and Waters (RIEW) – Varna.

33. Letter (Outg. No. 3257/26 November, 2003 to the **Varna District Court, Administrative Division Re.:** Appeal lodged by Albena Ltd. against Decision on Environmental Impact Assessment No. 3-3(95) 2003 issued by the Regional Inspectorate for Environment and Waters (RIEW) – Varna.

34. DECISION No.223/ 05.12.2003 of Ministry of Environment and Water concerning appeal of **Bulgarian Society for the Protection of Birds (BSPB)** against **Decision No 3-3(95) 2003** of the Director of RIEW-Varna.

35. DECISION No.224/ 05.12.2003 of Ministry of Environment and Water concerning **appeal of ALBENA LTD.** against **Decision No 3-3(95) 2003** of the Director of RIEW-Varna.

36.1, 36.2, 36.3, 36.4. RULING from 18.08.2004 VARNA DISTRICT COURT, Administrative Department, for Terminating of the proceedings concerning Administrative Case No. 2098 initiated by NGOs.

37. Legal and technical expertise in connection with administrative case No 984/2004; Legal expert: **eng. Georgy Enchev Georgiev.**

38. Supplementary Judicial-Technical Expertise on administrative case No 984/2004; Legal Expert: **Vassil Todorov Vassilev.**

39. RULING of Varna District Court, Administrative Division for rejection of the Albena Ltd appeal against **Decision No 3-3(95) 2003** of the Director of RIEW-Varna.

40. CASSATION APPEAL by Albena AD against **Ruling on Administrative Case No. 984/2004** of Varna District Court, Administrative Division.

41. OBJECTION by RIEW-Varna Against A cassation appeal by Albena AD and Anton Georgiev Petkov against **Ruling on Administrative Case No. 984/2004** of Varna District Court, Administrative Division.

42. MINUTES from the meeting on 28.09.2005 in the RIEW – Varna in connection with a visit of a mission of the Bern Convention.

43. Results of the study of the migration of Birds and bats in a location of a planned wind power plant near the town of Balchik, North-eastern Bulgaria. **BSPB/BirdLife Bulgaria** Technical Report Series No 2, 2005.

44. PROTOCOL. Minutes of the public discussion held on 24th July 2003 regarding the investment project “Wind Park for Generation of Electric Power – Wind Energy Park, Stage 1” on lot No 000287 of the land-use area of the town of Balchik, Municipality Balchik: investor “TESSA ENERGY” Ltd.

3.3.2.3. Documents provided by the Bulgarian Society for the Protection of Birds

Results of the study of the migration of birds and bats in a location of a planned wind powerplant near the town of Balchik, north-eastern Bulgaria. BSPB/BirdLife Technical Report Series N° 2 / 2005 compiled by Sergey Dereliev and Kamen Ruskov- scientific editor Dr Petar Lankov, Sofia. 43 pages.

4. OUR ANALYSIS OF THE CONTENTS OF THE ENVIRONMENTAL IMPACT ASSESSMENT

It appears to us that the EIA report is imprecise and incomplete especially with regards to a preliminary census of the flora and fauna. Here we examine the reports strengths and weaknesses.

4.1 Technical and geographical aspects

We were surprised to discover that the report mentions nothing of looking for an alternative site, the only reason for this given by TESSA ENERGY OOD company was that they acquired the site for the purpose of constructing a wind farm.

As well, we had to research and ask for confirmation to understand that Momchil covers two built-up areas: Momchil on the plateau made up of low built rural houses, partly abandoned and whereas the second Momchil consists of weekend homes built on the slopes separating the plateau from the Black Sea coast.

We have found no information concerning the height of the present communications antenna of the Ministry of Defence, or of the projected height of the proposed turbines that we calculated using technical information in the « Executive Summary-Environmental Impact Assessment – May 2003 ». We had to calculate the speed of the turbine blade tips that have a 72 metres diameter. This speed would be 235 Km/h if there are 17.3 revolutions per minute as indicated. As each rotor has three blades, it appears to us necessary to include this technical information especially considering possible risks of collision for migrant birds and bats.

For the rest of the technical part, the description appears to be detailed and complete

The obligations linked to the decision of approval by the EIA (points 4, 7, 8, 9, 16) merit the following thoughts on our part.

Point 4: the orientation of the setting of the turbines on a north-south axis appears in itself to be an interesting way of letting lower flying migrants pass the wind farm easily.

Point 7: the system for stopping birds from perching on the dangerous parts of the aerial power lines (obviously through electrocution) also appear interesting, to us.

Point 8 – painting the turbines grey and applying an anti-reflection system to the blades to reduce the visual impact of the wind farm appears commendable. However, such a system would make the turbines less visible for birds as well as for bats and would thus much increase the risk of collisions especially during foggy or misty weather which are probably quite frequent at this coastal site.

Point 9: the setting up of a fence seems unnecessary to us.

Point 16: a special system by which the blades could be stopped during times of heaviest migration was explained to us and appears pertinent. This would undoubtedly be the case in principal but apparently inapplicable at the proposed site. Effectively, with large scale migration occurring almost daily, during the day (as well as at night) and this from February until May and the end of July to November, the loss in energy production would be so considerable that it would be, no doubt, unacceptable for the company managing the site.

During the discussions we had at Varna, the possibility of lighting the turbines to avoid nocturnal collisions. The authors of the study agree that this remedy would only make the situation even worse. Lighting would only attract insects which bats hunt would mean they would be involved in even more accidents than birds. Specialists on this matter indicate that lighting can attract disorientated birds during foggy or misty weather, attracting nocturnal birds of prey, potential predators of small passerines in difficulty, kill nightjars attracted to insects. We know how much lighthouses using white light have a massive capacity for attracting nocturnal migrant birds.

4.2. Scientific aspects

The short period of time (from 1st March 2003 to 21st April 2003) allowed to the scientists doing the Flora and Fauna impact study partly explains why the results given in the EIA report are completely insufficient to objectively judge the impact the project would have on the natural environment.

4.2.1. Preliminary biological report in the EIA

The flora: There is no exhaustive list of plant species in the EIA report. There are interesting considerations of the plant communities in which species are mentioned.

Only two pages are given over to this topic. During our short visit in late September, not a good time for identifying plant species, many of the species we found are not cited in the EIA report. This is particularly true for the orchids, of which we found several dead stems.

Judging from the soil quality, there is no grazing, it is very likely that various orchid species grow here.

The fauna: We are aware that the time allowed for studying the fauna was quite short. It was very insufficient for making an inventory, counting and understanding the biological cycle of the species, indispensable information in such a case as this. In general, we consider that for various aspects including bird migration - does this only occur in spring – the methods used are insufficient and not very appropriate.

This report makes no mention of nocturnal animal activity (bats, terrestrial mammals, amphibians, birds).

As the scientific studies were undertaken in the spring there is evidently no information on the breeding birds (13 species).

Nocturnal bird migration is completely disregarded although is probably very important on this migration route. It is true that if only using classic methods of field observation it would be hard to estimate its importance.

We would have preferred that the researchers had spent more time examining bird activity on the site.

Autumn diurnal migration was observed on only a few days, too few in our opinion. However, the results give an interesting and original insight into the sequence of events.

The short statements concerning the Via Pontica in no way indicate the exceptional importance of this bird migration « motorway ». We consider that, taking account of its large scale use by migratory birds and heritage value of the species that use it, that the Via Pontica can be classed as the most important migration flyway for European birds and is indeed one of the most important in the world.

Still with regards to birds, from this partial study, taking into account the observations that had to be made, that it doesn't give a true picture of the overall bird population using the proposed wind farm construction site. Otherwise, the additional report made after the EIA provides some new data.

We took into account the information in the report, for reptiles, for the single species of amphibian mentioned and the mammals.

Due to its being very incomplete and thus the little biological data it contains, it is all the more surprising that this EIA report concludes by considering there would be an insignificant impact on flora and fauna. It is even more surprising that, on the contrary, it asserts that new habitats would be available to animals thanks to the construction of the wind farm.

Hence, it is logic that those with no specialised knowledge of fauna or flora would tend to believe on this playing down of the impact of this wind farm.

4.2.2. Intermediate scientific results

The preceding EIA report was complemented with a new report dated 9th July 2003, and takes into account the bird's breeding season.

The end of the spring migration period is covered and substantially adds to the species inventory. But, the number of birds using the site after early July (the end of the period considered in this report) notably during the autumn migration period between late July and November (during the day as well as at night), and during the winter period was not studied, although this is fundamental within the framework of the understanding of such a project. It is all the more regrettable as autumn migration is extremely important in the area.

It is interesting to note that during the autumn migration period, birds arriving from Albena plain at the Balchik plateau against a strong head wind, decide to go round the massif, but not all!

The mapping methods used when investigating breeding birds seem to have been correctly used and the results provided satisfactory.

The number of pairs of each species breeding on the site is given.

Although, theoretically, information from ringing operations can be a useful complement to direct observations, in the present case, with only 72 birds caught during the period, the amount of additional information provided is negligible and of little use.

Once again amphibians are represented by just one species, the Green Toad *Bufo viridis*. As can be seen in paragraph 3.2.8., an additional species was found at the Balchik site during our visit; the Common Tree Frog.

Of those on the preceding list (9 species) in the EIA report, and those in the supplementary report (5 species) only three are common to both (Greek Tortoise *Testudo graeca*, Green Lizard *Lacerta viridis* and Large Whip Snake *Coluber jugularis*). Thus, 6 reptile species disappeared from the EIA list and two new ones appear (Sand Lizard *Lacerta agilis* and Slow Worm *Anguis fragilis*).

Concerning mammals, 6 species were given in the EIA report whereas 8 species are included in the supplementary report. However, only two species are common to both lists (Brown Hare *Lepus europaeus* and Lesser Mole Rat *Nannospalax leucodon*). The new species added are: Red Fox (*Vulpes vulpes*), Weasel (*Mustela nivalis*), European Polecat (*Mustella putorius*), Wood Mouse (*Apodemus sylvaticus*), Mole (*Talpa europaea*), Greater Horseshoe Bat (*Rhinolophus ferrum-equinum*) This shows the inadequacy of the methods used for these inventories, their use seems poorly investigated and results incomplete.

The part of the report concerned with risk exposure, refers to work done elsewhere in the world on this problem, but too few publications have been consulted. However, those given in the references are of a high quality.

Predictions on collisions with turbines, if constructed on the proposed site, are of course guess-work. Nobody can predict the amount of casualties with certainty. The final conclusion that the future wind farm would induce little risk to birds can be further explained by the fact that bird migration was considered unimportant by the authors of this report. They don't take into account the autumn migration that involves millions of birds that use the Via Pontica flyway or nocturnal migration that, at least for the moment, hasn't been adequately studied. As regards risks to bats, the problem was incorrectly studied as it was stated that bats are absent from the site.

5. COMPLEMENTARY SCIENTIFIC DATA

5.1. New ornithological report on postnuptial migration over the Balchik site by the Bulgarian Ornithological Society for the Protection of Birds

In a 43 page report edited in 2005, the BSPB gives the results on bird migration work and counts undertaken from 9th August to 15th October 2003, on the proposed wind farm site.

This report wasn't taken into account by the Bulgarian authorities probably because of its late publication.

The method used here is that used everywhere for monitoring bird migration (observation throughout the day by competent ornithologists in sufficient numbers).

The results include 400 000 birds counted, of 112 different species of which 104 000 were soaring birds.

Of these species, those that are included in an international action plan due to their being globally threatened (Globally endangered species), were counted: Dalmatian Pelican *Pelecanus crispus* (87 ind.), Lesser Spotted Eagle *Aquila pomarina* (157 ind.), Greater Spotted Eagle *Aquila clanga* (4 ind.), Imperial Eagle *Aquila heliaca* (4 ind.) and Eleonora's Falcon *Falco eleonora* (6 ind.).

Among the most numerous species present were: White Pelican *Pelecanus onocrotalus* (9 243), White Stork *Ciconia ciconia* (86 812), Common Buzzard *Buteo buteo* (4 514), Wood Pigeon *Columba*

palumbus (7 863), Bee-eater *Merops apiaster* (14 800), Sand Martin *Riparia riparia* (190 093), Swallow *Hirundo rustica* (20 768), House Martin *Delichon urbica* (51 097), White Wagtail *Motacilla alba* (4 471), Starling *Sturnus vulgaris* (4 347) and Chaffinch *Fringilla coelebs* (3 673).

Also, studying the nocturnal migration by observing bird silhouettes as they cross the moon (a few days before and after the full moon), has shown there to be a lot of migration activity, a total of 14 500 birds were counted, the equivalent of 915 birds passing per hour. This method however doesn't allow for specific identity; at the most a very experienced observer can identify the bird at family level.

Our remarks:

We deplore the fact that this work wasn't taken into account in the supplementary scientific documents of the EIA. Especially as the contents of the BSPB report are particularly relevant, not only concerning the importance for and use of the Via Pontica by migrants at the end of summer and during early autumn, but also because of the numbers that fly over the site of the proposed wind farm at altitudes putting them at risk from the turbines.

We regret however that less attention was paid to passerine species and they were counted with less accuracy than the soaring species and that observations didn't continue into November.

Nocturnal migration is shown to be important and without doubt more so than can be supposed from simply watching for silhouettes passing in front of the moon.

We understand that the importance of nocturnal migration has only been touched on here. For a better understanding of this phenomenon, expensive and sophisticated technical means exist, such as radar, and would be indispensable.

We notice that in figure 1. of the report that observations stopped during a period of heavy migration (from 10th to 14th October). We can only guess that there was also heavy migration during the days following the end of observations.

We should also like to insist on the fact that at similar latitudes diurnal migratory activity reaches a peak during the second half of October and first ten days of November. Passage occurs during the day and at night with such species vulnerable to wind farm collisions as: Crane *Grus grus*, Woodcock *Scolopax rusticola*, Lapwing *Vanellus vanellus*, thrushes *Turdus sp.*, Skylark *Alauda arvensis*, etc....

5.2. Migration phenomena during our visit to the wind farm project site at Momchil on September 29th 2005

As were described in our account of our field visit in paragraph 3.2.2., there was active migration during our visit including over the proposed wind farm site. Those birds observed passed at low levels in the early morning, thus at a potentially vulnerable height. Later in the morning, rising temperatures meant birds of prey were higher, but not all. Of all the species of raptors seen flying at a low level the following are of particular interest: Lesser Spotted Eagle *Aquila pomarina*, Common Buzzard *Buteo buteo*, Goshawk *Accipiter gentilis*, Sparrowhawk *Accipiter nisus* and Levant Sparrowhawk *Accipiter brevipes*.

As weather conditions at the time weren't particularly favourable, what we observed would only tend to support the conclusions of the BSPB.

5.3. Our night visit on the site to listen to migrating birds on active nocturnal passage on 1st October 2005

Our brief nocturnal visit to the wind farm project site, the 30 September 2005, showed that despite using methods that were somewhat inadequate and probably unrepresentative of the total migratory activity above our observation position, birds were passing. Those species heard had until now been little recorded by the team of Bulgarian ornithologists.

6. VIA PONTICA, A HIGH WAY FOR MIGRATING BIRDS

It is worth underlining here that it is very rare for a bird migration flyway to have a name. It is due to their extreme importance that such migratory "motorways" have a name. The fact that the one

that runs along the Black Sea is called the *Via Pontica* is significant and a recognition of its great importance.

These migration flyways are situated in regions where the geography and relief of the landscape force migrant birds to converge towards a « Bottle necks ». The obstacle of the sea coast, an important mountain chain force birds to make a detour and the barrier acts as a migration crossroads. The straits of Gibraltar, Messina, and Bosphorus are the best known and most important such sites in Europe that concentrate terrestrial migrant birds that in general dislike flying over large stretches of ocean. Sometimes stretches of coastal sand dunes separating the sea from large lagoons play the same role, such as the Courland on the shores of the Baltic Sea.

6.1. Definition and Eurasian rank of this bird migration way

In Europe, the two most important and also the best known are the *Via Atlantica* in which migrant birds collect at the Straits of Gibraltar and the *Via Pontica* which increases as it's joined by the *Via Aristotelis* before crossing the Bosphorus.

6.2. The flyway's geographical limits

Birds of different origins, those from western Europe such as Black Storks *Ciconia nigra* coming from as far west as Belgium, mix with birds coming from central and eastern Europe, and even from western Siberia, to join on the *Via Pontica*. The obstacles in Europe formed by Alps and the Carpathians forces main birds to fly round them.

The *Via Pontica* is in this way fed by many migratory routes that avoid the Carpathians with others coming from the Baltic region, Russia, Belarus, the Ukraine and Moldova to come to the coast of the Black Sea. This flyway is forever increasing as it incorporates more flyways on its approach to the Bosphorus to later follow the coast of Syria, Lebanon and Israel, forever picking up other flyways before arriving at the Red Sea and then following the Nile valley.

Birds taking this migration route can, according to species, arrive at their wintering grounds in Greece, Turkey, the Middle East and Egypt, whereas others go on to sub-Saharan Africa, from Sudan as far as the southern tip of the continent. This route is used both during spring and autumn migrations. The exact itinerary varies according to the season, and species are not necessarily the same. The number of migrants in spring is lower than that in summer and autumn.

On the banks of the Black Sea, the *Via Pontica* doesn't necessarily hug the narrow coastal strip. The sinuous coastline and landscape can force the migration front of the *Via Pontica* to be sometimes narrow (sometimes less than 1 km), whilst at other times it can be wide.

Also, soaring birds use a different strategy and have a different itinerary than birds using flapping flight. It's also possible that nocturnal migrants have different behaviour and routes. Flight altitude also varies greatly according to species, landscape, orientation, wind strength, cloud cover and temperature.

During our very short stay on the Pontic coast, when there was active autumn migration, we found that migrant birds, all species, arrived a little before Balchik in concentrated groups along the coast on the plateau. This is probably due to the coasts outline which is oriented east-west between Kaliakra headland and Balchik. The flyway seems to open out a little on Momchil plateau after passing through the valley over Balchik. But this is mear supposition after a short stay. The BSPB ornithologists that worked on the Momchil plateau described the unfurling of migratory movement in a similar way (pages 16 & 17 of the BSPB report).

Above the town of Varna, we observed the movements of soaring migrants. The concentrated movement passes near the Maritime Museum, on a front no wider than 500 metres.

6.3. Its importance and the bird species involved

We learnt, by looking at the counts of migrants taken at different times of migration, that the *Via Pontica* is used by hundreds of thousands of birds in spring, summer and autumn.

The totals given by the researchers don't reflect the total numbers of birds migrating during the day. If we also take into consideration the enormous numbers of passerines of which there are only partial counts, the fact that the whole migration period wasn't covered and the movement at night

which is generally greater than during the day, stating a number in millions is neither wishful thinking, or an exaggeration, but a notion that can't be far from the truth.

The comparison between the three ornithological reports (EIA report, Intermediate report and BSPB report), shows a list of 133 species watched on the site project. We consider that the further more complete studies, mainly on nocturnal migrating birds, could add at least some 50 other species (Hérons, ducks and geese, rails and crakes, Waders, owls, species of Turdidae, Sylviidae, Fringillidae, Buntings)

6.3.1. Diurnal migration

6.3.1.1. Prenuptial migration

Without doubt the *Via Pontica*, like in other flyways in Europe, spring migration starts as early as the end of January and ends in late June with the last of the swallows.

Those species migrating using flapping flight can move throughout the day but prefer the first part of the morning. On the other hand soaring species generally wait for temperatures to rise before moving. It's thus from mid morning that their migration starts to continue until late afternoon.

Atmospheric conditions very much alter migratory activity. Fine weather accompanied by favourable light winds is favourable for the migration of every species.

When the weather is less favourable, those species that use flapping flight continue their migration. Other species tend to wait for better weather. .

6.3.1.2. Postnuptial migration

Much more studied than spring migration, autumn migration can be very spectacular on the most favourable days. It can start discreetly towards the end of July when the first Swifts *Apus apus* leave. At night, warblers such as Sedge Warbler *Acrocephalus schoenobaenus* have already started migrating.

We find during the autumn migration the same type of behaviour linked with climatic conditions as seen in the winter and spring.

6.3.2. Nocturnal migration

Generally, nocturnal migration involves far bigger numbers of birds than that during the day. Radar studies have proved this. Certain species have been shown to be nocturnal specialists, they include: *Rallidae*, *Strigidae* (*Otus sp.*), *Caprimulgidae*, *Sylviidae*, and certain *Turdidae*.

Other species only migrate during daylight, these include *Falconiformes* and *Fringillidae*.

Many others can migrate at night as well as during the day and can cover several thousand kilometres without stopping (*Anatidae*, *Charadriiformes*).

6.3.2.1. Methods of investigation and their limits

If here we take the opportunity to mention various aspects of methods used to study migration, it's in order to indicate the usefulness of using techniques complementary to more classic observation methods that have been used in conjunction with the Balchik wind farm project.

In the preceding paragraphs we have mentioned nocturnal migration that wasn't studied for the EIA report, or its study envisaged for the supplementary studies.

Only the BSPB examined this particular aspect of migration.

The observation of diurnal migration at times of massive movements implies the use of well trained observers. They have to find the birds, identify the species concerned, count them, estimate their altitude and flight direction, note behaviour and any other factors that may be useful in analysing the data (atmospheric conditions, cloud cover, temperature, wind force and direction, rainfall etc..).

Having taken part in such activities many times, we can testify as to how difficult it is to keep observing without being distracted.

Observing nocturnal migration can be done using several different methods and techniques of which none are totally satisfactory.

1) Listening for calls only gives an imperfect idea as to species concerned. Calls do not carry far, so only a small part of the sky is taken into account.

2) Observing silhouettes crossing the moon only very occasionally allows for specific identification, it only covers a very small part of the sky and can obviously only be used when during the period of a full moon.

3) The tape luring system is a method used by researchers to trap more birds. It consists of playing the song of the species to be attracted. Migrating birds then land close to the source of the song and generally do not continue their migration, even if the recording stops playing. This method only works for certain species; it doesn't attract all individuals of the chosen species and in interrupting the nocturnal migration of the attracted birds, it can severely upset their migration strategy, it may even bring birds to land in inhospitable or dangerous habitat. However, when used sparingly and with caution can help to reveal the presence of otherwise unthought-of species.

4) The use of radar is without doubt the best method for nocturnal investigation of bats or birds. Although the analysis of radar echoes can rarely help in specific identification, their size, spatial position and speed usually allows for their being classed into a species category or family. There are considerable advantages in using radar and echo density can give precious information on the bird numbers, their altitude, flight direction and speed. At the present is judged the most efficient and reliable method for measuring bird's nocturnal activities and of those of bats, especially within the framework of impact studies prior to wind farm erection and in measuring their real impact once constructed.

6.4. Origins and destinations of some migrating birds through the results of satellite tracking

As an example, we give here a few results from publications concerning satellite tracking using the Argos system, with transmitters applied to some of the species which migrate via the *Via Pontica*

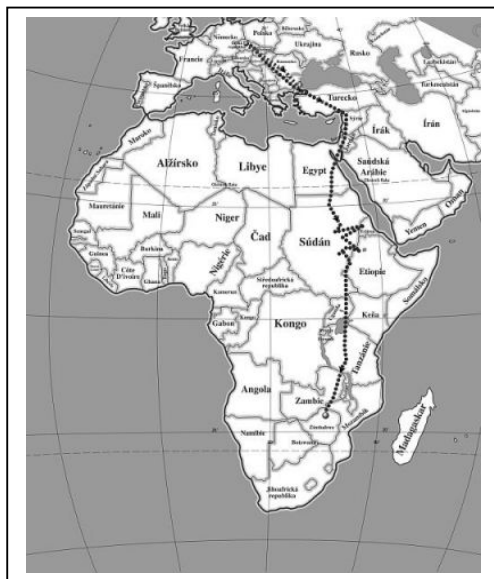


Figure 1



Figure 2

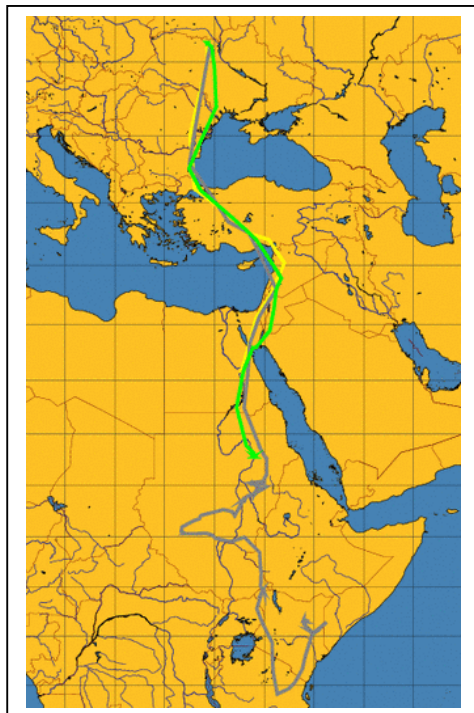


Figure 3

Figures 1, 2 & 3 show migration routes of White Storks followed by satellite tacking. Note that the Czech stork (figure 1) is attracted by Via Pontica.

Figures 4, 5 & 6 concern satellite tracking of Black Storks from Czech Republic

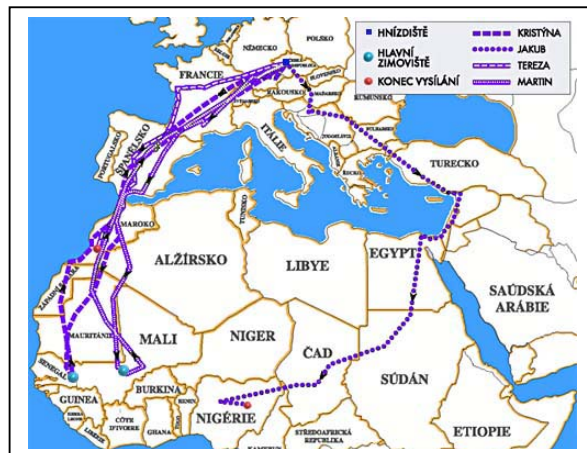


Figure 4

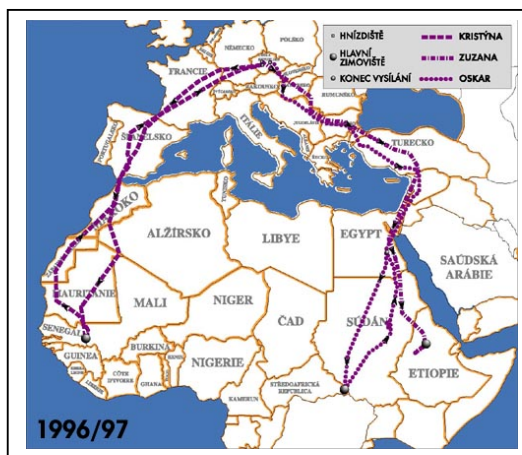


Figure 5

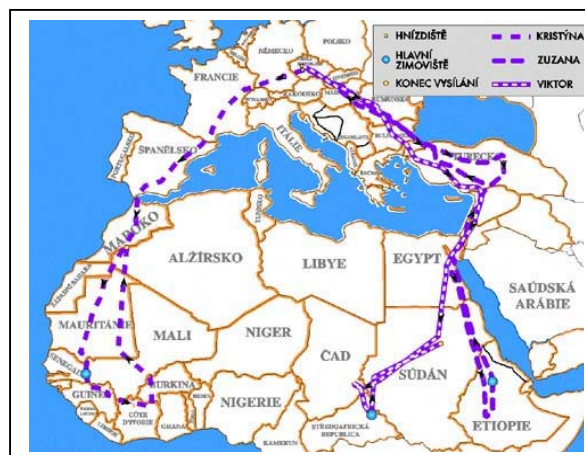


Figure 6

7. NECESSARY BIOLOGICAL INFORMATION THAT'S LACKING

Studies on problems that can potentially be caused by wind farms, especially to birds are numerous and often very well documented. However recommendations as to methods to be used in impact studies and solutions for avoid the risks of serious disturbance or collisions appear in official documents in 2002. The conference of Bonn Convention members adopted a resolution (7.5) on wind farms and migratory species of mammals and birds in September 2002. The recommendations were the following:

- identify those areas where migratory species are vulnerable to wind farms and assure the protection of these species,

- apply procedures for evaluating impact,
- evaluate possible ecological impacts of wind farms on the natural environment and migratory species,
- evaluate the impact of constructed wind farms,
- apply the principal of precaution.

In December 2003, a very well documented report, produced by BirdLife International entitled « Wind farms and Birds: An analysis of the effects of wind farms on birds, and guidance on environmental assessment criteria and site selection issues » was presented before the Bern Convention standing committee. The recommendations in the report are the same points as taken up in the Bonn Convention resolution. However, added to this is the provisor that field studies should last for at least a year. Only in December 2004, the « Projet de Recommandation sur l'atténuation des nuisances de la production d'énergie éolienne sur les oiseaux et les chauves souris » was examined by the Bern Convention Standing Committee.

Lastly, in May 2005 the European Union commission organised a working group of experts to examine Wind energy and biodiversity. This working group is charged with elaborating resolutions that haven't so far been adopted. These recommendations should make states vigilant in the matter of the quality of studies concerned with the impact of the construction of wind farms on the environment and biodiversity.

All biological specialists agreed in thinking that field studies should be conducted for at least a year in order to discover faunal and floral species annual cycles by applying the present protocol. For migrant birds and bats, periods of diurnal and nocturnal migration should be investigated with the greatest care and using the most appropriate methods.

The conclusions of such studies shouldn't concern only qualitative considerations but include quantitative information on the species with precise details of results concerning breeding seasons, on both diurnal and nocturnal migration, with numbers of birds and species involved, fly routes, migration periods, flight altitudes, atmospheric and weather influences. And also take in account the maximum amount of data on the wintering period of the birds.

In the particular case of the scientific work carried out within the framework of the EIA on the Balchik wind farm, we consider the results to be greatly insufficient, and for some aspects that there's a total lack of data. From our point of view, it is indispensable to fill these gaps as soon as possible.

Those aspects that are missing are listed and discussed below.

7.1. On plants and animals other than birds

We have noted that a complete list of plant species needs elaborating that takes the whole annual cycle of the vegetation into account. *i.e.* from March to August or September

The variations in the lists of mammal and reptile species from one report to another shows that little attention was paid to making an inventory of these groups, to their abundance, their distribution, or their possible sensibilities to construction work or operation of the planned wind farm.

7.2. On breeding birds

In the preliminary report for the EIA and then in the intermediate report by Dr Nankinov, field studies on breeding birds within the wind farm construction zone and its vicinity were properly conducted. Further data on the home ranges of breeding species would be useful. We know for example that Eagle Owl *Bubo bubo* come to hunt on the plateau. What is its prey species?

7.3. On nocturnal bird and bat migrations

As we have indicated above, nocturnal bird migration is more important than diurnal migration. For certain migration routes such as that along the English Channel, the height of diurnal migration involves hundreds of thousands of birds, whereas the nocturnal passage is in the order of several millions.

Does migration along the *Via Pontica* fit into this pattern seen elsewhere? Knowing that migrants are potentially much more vulnerable to turbine collisions at night – this is especially true for bats – this aspect of migration mustn't go neglected or ignored.

We recommend that specific studies on nocturnal migration are undertaken, in spring as well as in the autumn, before any decision is taken as to the construction of a wind farm. The use of radar would be the ideal tool for such research.

Thus, special attention can then be paid to those species involved, the number of migrating birds, the flight lines and their direction, the migration periods, the altitudes of movements, all these in association with the prevailing atmospheric and weather conditions.

7.4. On the wintering birds

As no investigations have been carried out in the winter period, especially on birds, within the framework of the EIA work we consider this to be a deficiency that needs to be corrected.

Special attention should be paid to species that winter on the plateau (project site and surrounding area) to species that eventually use it as a feeding place, to the birds which cross the site during day or night (feeding and roosting movements, hard weather movements in a cold spell).

7.5. The Bat problem

As certain species of European bat are migratory and because the *Via Pontica* may be used by these animals during their migrations, it is important to investigate the matter.

7.5.1. Collecting information on species occurring on the site and its surroundings

Effective methods for revealing the presence of bats use special technology (ultra sonic detection systems, radar). Others, such as mist-netting or observing for silhouettes crossing the moon are often highly unproductive, they are considered useful as secondary methods.

It would be enough to visit particular sites, caves particularly, where bats rest. Some bat species can cover large distances to visit feeding grounds. Thus a bat cave, even one several kilometres from a wind farm site, isn't necessarily outside its influence.

8. THE RISK EVALUATION FOR BIRDS AND BATS

IN THE UNITED STATES, bird deaths during nocturnal migration by colliding with towers can sometimes be quite spectacular with 10 000 Lapland Longspurs *Calcarius lapponicus* dead in one night in snowy weather or again 12 000 birds that died in one night after hitting a television relay mast in Florida. But these collisions are exceptional.

So, it's enough to evaluate the risks that the construction of a wind farm might pose for birds and bats, especially migrants, the relative literature is relatively abundant.

The mean death rate per turbine per year, according to the specialised scientific literature, is generally low; in the order of less than one bird per turbine per year. However, at sites well frequented by birds this mean may reach 3.4.

When considering bats, the mean value for collisions is clearly higher. It varies between 0.74 and 4.75 individual deaths per turbine per year. These values are for sites on migration routes of certain species of bat of the genus *Lasiurus*. In Spain, the mean mortality rate for bats caused by wind farms can be as high as 13.36 individuals per turbine per year.

Can the conclusions concerning different cases correctly studied across the world be used in the case of the Balchik site?

Each site has its own particularities (geographical situation, relief, topography, climate, atmosphere, importance of the migration route, numbers, turbine density and characteristics, etc.) which make it difficult and sensitive to evaluate the importance and nature of the risks that the Balchik site might create.

But the knowledge gained elsewhere is very useful, and needs to be taken into account.

8.1. Specification of the site and of the migration way

Considering that the *Via Pontica* is one of the world's most important flyways and that is used by soaring birds known to be susceptible to turbine collisions, that nocturnal migration which has yet to be counted is probably more important than the diurnal migration and that several species using this flyway or that occur in the area around Balchik in winter are categorized as being endangered or threatened on a worldwide scale, and considering that the proposed site for the wind farm lies on this flyway, extreme vigilance is considered necessary in order to assure this flyways protection.

In the world two very important flyways, in ways comparable to the *Via Pontica*, have been confronted with the problem of wind farm construction in their path, they are the Altamont Pass in California and at Tarifa near the Straight of Gibraltar in Spain.

8.2. Disturbance during migration

During diurnal flight, whilst coming against the wind farm obstacle, migrant birds can react in two ways. Either, they opt to avoid the structure by flying around it or by gaining altitude to pass over it; or, they fly into the site endeavouring to manoeuvre between obstacles or flying low to try to pass under the rotating blades.

At night, birds detect obstacles less easily and, if they can, most will choose the shortest distance. So the risk of collision is much higher.

8.3. Risks to birds on migration

Generally speaking, small wind farms situated in areas used by few birds cause very few deaths, in the order of less than one to a few bird deaths per turbine per year. On the other hand, in areas with a lot of bird activity, as along migration routes, the mortality rate can be as high as a few birds each day. With consideration to the conservation of biodiversity, such a situation should be seriously questioned.

The project presently under revue, which concerns a mere 12 turbines, is small compared to many other wind farms around the world. Also, the fact that the turbines are placed at least 300 metres apart helps to reduce the risk of bird strikes.

In the minutes of the debates that have been concerned with the problem of the risks of wind farms to birds and having heard such discussions ourselves during the meeting at Varna, those defending the wind farm project maintain that turbines at Balchik would cause few deaths. Some even go as far as to state that they wouldn't cause any more deaths than 4 kilometres of road. What would really happen if the wind farm was built? Nobody has the answer, the answer to the question remains sensitive and of course, uncertain. But it should be emphasized that in the eventuality of the Balchik wind farm being constructed, and it results in few mortalities, the patrimonial value of the eventual victims is almost impossible to evaluate. In reality, those species that are likely to be victims of collisions with road traffic in Bulgaria have probably far less patrimonial value than those that collide with wind turbines (large birds of prey, storks, pelicans and Corn Crake; to mention a few). In terms of conservation importance, it is easy to understand that the death of a Chaffinch is no where near as important as that of a Lesser Spotted Eagle, the consequences of the death of a Garden Warbler have little in common with the loss of one of the world's few surviving Slender-billed Curlews.

With regards to nocturnal migrants and especially the Corn Crake, we already know how deadly electricity power lines can be in the area when they cross a migration route. We also know that alone, the metal mast supporting the anemometer that collected wind data used in the preparation of the EIA report was responsible for the deaths of at least two birds (1 Quail and 1 Blackbird). Although only anecdotes these accidents go to show how important nocturnal migration might be at the site and the probable high risk of collisions with obstacles in the birds' flight path.

8.4. Vulnerable species

Concerning the birds, the families or species at most risk of colliding with the wind turbines, during the day as well as at night depending on the species migration regime, are: Grebes, Pelicans, Cormorants, Herons, Ibis, Spoonbill, Storks, Swans, Geese, Ducks, Raptors, Quail, Crane, Bustards, Rails, Crakes, some Wader species, Turtle Dove, Larks, Thrushes.

Bats species that are known to have been killed by wind turbines in Europe, are: Noctule *Nyctalus noctula*, Leisler's Bat *Nyctalus leisleri*, Serotine *Eptesicus serotinus*, Northern Bat *Eptesicus nilssoni*, Parti-coloured Bat *Vespertilio murinus*, several Pipistrelles *Pipistrellus pipistrellus*, *Pipistrellus pygmaeus*, *Pipistrellus kuhlii*, *Pipistrellus nathusii* and Savi's Pipistrelle *Hypsugo savii* (SFEPM, 2004).

8.5. Risks to breeding and wintering birds

Certain breeding species are capable of accommodating the presence of turbines, while others are disturbed and move out of the immediate area. The breeding bird species of Momchil plateau are of relatively little interest, except maybe Eagle Owl, and we consider the construction of a wind farm on the site wouldn't be particularly harmful. The period of construction work would cause much disturbance and generate permanent habitat damage.

As for the wintering birds, as we have no information on species concerned, numbers present or use of the site, it is impossible to give a well founded point of view.

8.6. Risks to Amphibians, Reptiles and Mammals

During the construction of the turbines and associated infrastructure it's obvious that animals would suffer from disturbance, habitat loss or be destroyed. We could suppose that for the more mobile, the reptiles and mammals could leave the site, hopefully temporarily. However, two species of underground mammals (*Talpa europaea* & *Nannospalax leucodon*), that occur in small numbers on the plateau due to the grounds stony nature, may well lose the little appropriate habitat present on Momchil plateau.

8.7. Evaluation of measures of minimizing the risks

As we stated in paragraph 4.1. (Points 4, 7, 8, 9, 16) concerning measures of minimizing risks which is an integral part of the solutions recommended by the Environment administration in its decision to accept the EIA report.

The wind farm, even if it only has twelve turbines could pose serious problems to raptors and other large soaring birds that pass at low altitude over the plateau. If the probable hypothesis of large scale nocturnal migration is correct, the risk of collisions could be very important. Very vulnerable species such as Corn Crake (a Globally Endangered species) which migrates with Quail flocks, could be one of the most numerous victims.

Can we then be a little less precautionous and take the risk, and despite all build the wind farm, and be responsible for the deaths of birds, some of which are of which are of great international importance?

The question would be better asked when additional scientific data about the general faunal situation was made available.

9. RECOMMENDATIONS

We have been made aware of how important is the lack of faunal and floral data concerning the proposed wind farm construction site on the Momchil plateau at Balchik. At the least, a full inventory of the sites plants and animals needs to be undertaken. But, more than this, it would be useful to collect as much data as needed to correctly understand the impact a wind farm would have upon the whole wildlife heritage of the site.

9.1. Necessary additional informations

We would advise that before any further permanent decisions are taken concerning the construction of a wind farm that the following essential scientific studies should be accomplished:

- *Studies should be completed, in order to give an exhaustive understanding of the sites flora, taking into account its heritage value and conservation status,*
- *establish a full inventory of the sites species of mammals, reptiles and amphibians,*

- *and complete this inventory with data on each species population sizes, a study of their ecology and biology whilst taking into account their use of surrounding areas,*
- *make a study of the sites insects paying particular attention to any species listed in annexes II et IV of Directive 92/43/CEE concerning the conservation of Natural Habitats and the wild animals and plants they support,*
- *possibly complete the available data on the breeding birds,*
- *access of the numbers of birds wintering on the site and its surroundings paying attention to the different uses made of the site,*
- *collect the necessary information to obtain a complete view, qualitative as well as quantitative and future, of the bird migration, nocturnal as well as diurnal, during both spring and autumn migrations, paying special attention to those species passing close to the proposed wind farm construction site,*
- *include in the study the possible use of the site by bats, whether during the breeding period or during migration, or at other times when bats may be active.*

9.2. Advise on the study of alternative sites

- *Acknowledging that the studies that were undertaken on migratory bird, and that our own observations, show the proposed wind farm site to be on the Via Pontica flyway, a migration route used by very large numbers of numerous bird species that are could be at risk from a wind turbines, we recommend, in virtue of the principal of being cautious, that the search for an alternative construction site situated away from the very sensitive line of the Via Pontica should started as soon as possible.*

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