THE IMPACT OF THE WIND POWER STATIONS ON THE AVIFAUNEI THE SITES OF COMMUNITY IMPORTANCE

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ABSTRACT: *Modern wind turbines have evolved toward smaller predecessors and uses a sophisticated technology aimed at improving the efficiency and, in large part, are based on the same form. The most frequently used in commercial wind turbines has a generator with horizontal axis, housed in a nacelle located on the tip of a vertical tower and three blades which are rotated in the vertical plane. The nacelle can rotate the tower, ensuring straightening blades always point in the direction of the wind. At present, the new types are in developing countries, such as the vertical axis turbines and turbines flying. Because these types of turbines have not yet come to the commercial production phase, the current review focuses on the usual patterns. The wind parks have an impact on migratory species in both the construction phase, in respect of loss or habitat degradation, hassle habitat, as well as in the operating phase, through direct mortality and clutter (habitat degradation). The migratory species, in the case of which the impact is likely to occur, include fruit bats, terrestrial and marine mammals, birds, fish, crustaceans and squid. In the case in which the number of parks and turbines increases, its impact at the population level at certain migratory species could become significantly. At present, a better understanding of this problem is a major responsibility at international level, in particular in the case of poultry and the bats. The first measures were taken to shape and to assess the effects on the trends of migration and populations which could generate sea wind parks in the North Sea, where they pass important migration paths used by numerous species of birds.*

KEY WORDS: *wind turbines, sites, the habitat of the migratory species***.**

1. INTRODUCTION

used to provide power to a lens, an engine or transmitted in the mains. The kinetic energy of the wind is captured by the blades of the wind turbines aerodynamic who oppose the wind. The amount of electricity that can be produced by a wind power is a function of the quantity of kinetic energy that can be retrieved. The wind energy of origin is part of the energies obtained from renewable sources. Aero-generator uses the kinetic energy of the wind to cause the rotor shaft or: this is converted into mechanical energy, which in turn is converted into electrical energy by the generator mechanically engaged at the wind turbine. This mechanical clutch can be done either directly, if the turbine generator speed and have the same order of magnitude, either may be achieved by means of a multiplier effect. Finally, there are several possibilities to use electric energy produced: either is stored in the batteries or is distributed via an electrical networks, or are supplied isolated tasks. The conversion of the wind systems and losses. Thus, it may also be noted a yield of approximately 89 - 90%.

The wind generators shall be classified according to the orientation of the tool's axis of rotation in:

- wind turbines with horizontal axis;
- wind turbines with vertical shaft;
- wind turbines what use mobile devices (least used)

Most often, the wind center the most commonly used for the obtaining of electrical

energy is the wind turbine with horizontal axis and with the rotor blades with a specific aerodynamic profile, so as to obtain a good compromise between the coefficient of power, cost and the speed of rotation of the wind receptor, as well as an improvement in the aesthetic appearance, the front of the rotor with two blades. Wind with horizontal axis are the most used, because their efficiency is superior to that of the aerodynamic wind with vertical shaft, are less subject to mechanical important and have a lower cost.

The effects during the construction wind park are similar to the effects of the other projects include the construction and mortality, loss and disturbance of the habitat impacts. The level and duration of the effects will vary depending on the environmental and ecological factors, as well as the location, timing, duration, intensity and the size of the project in question techniques of construction and any measures in order to reduce environmental impact. Although the construction phase is generally much shorter than a period of exploitation of a wind park, activity can be more intense during the construction and reactions may be more obvious. The statistics provided by the European Association for wind energy (EWEA) shows that the construction, for a wind park land, can be between two months in the case of a 10 MW wind park and six months for a 50 MW wind park. The construction of the sea wind parks, which are, in general, the greater, this period may take up to a few years. Although the technical details concerning specific wind parks varies, the construction involves the creation of a foundation on which is mounted the tower and, after that, the rotors are raised in working position.In general, the wind power plants may show the following potential hazards for birds:

•disturbance and changing the flight routes;
• loss of habitats;
• mortalities occur due to collision with the wind turbines;

The effects caused by the wind power stations on the avifaunei are different, depending on the species, the season and place their location. Some studies indicate negative effects on paasarilor up to 600 m, in accordance with the ***Allan L., Drewitt & Rowena H. W. Langston****, Assessing the impacts of wind farm son birds, IBIS – International Jurnal of Avian Science, Volume 148, Issue s1, March 2006, Pages 29 - 42,* The distance from the wind turbines and a reduction in the land use adjacent to, or even the absence of the area. In the case of large wind parks, cumulative areas around each wind turbines can reach the considerable surfaces.

Also, some parks containing a large number of turbines can be deemed to constitute barriers to the roads of migration of the birds. Another factor of stress would be the movement of people, vehicles and other equipment in the area of the wind power stations. From the position of the 5 turbines wind parks can be seen easily emphasize the effect of the barrier to the movements of the birds, because they do not have been provided for the wide corridors passing through turbines, on the main directions of flight.

1.1. Poultry mortalities occur due to collisions with wind power plants

Most of the studies have shown reduced mortality among birds, as a result of collisions with wind turbines. However, if the number of turbines is high, even if the average of deaths for each turbine is low, the cumulative mortalities occur may have an effect on the avifaunei big enough. In the case of large birds, with a reduced rate of reproduction, this can have a particular importance. Therefore, the location of the wind power plants should be done only in areas with a low concentration of populations of species of birds, with a low specific diversity and non-essential for the survival of the species vulnerable interest.

The poultry which bypass the wind turbines during migration or flies over their avoiding-they will be obliged to resort to a higher energy consumption, which may influence their rate of survival. The risks of collision are higher on the wind, rain, on nights without fog or in the month. In these conditions, the height at which the flying birds is greatly reduced, and the lights turbines can attract birds, in this way increasing the risk of

collision. The significance of the impact for the bird species listed in Annex I to Council Directive 2009/147/EC (shown in Table *), and those with a regular migration present in the protected area ROSPA Bestepe0009 - Mahmudia are shown in table 1.

Table 1. Species of birds with regular migratiune from the protected area ROSPA Bestepe0009 - Mahmudia

Nr. crt.	Scinetific name	*Scientific popular*	The effect of the barrier	Risk of collision	The loss of the feeding territory	The loss of nest sites
1	Ciconia ciconia*	White stork	+	+	-	-
2	Circaetus gallicus*	Serpar	+	+	+	-
3	Circus aeruginosus*	The reed eretele	-	+	+	-
4	Circus cyaneus*	Eretele wild	+	+	+	-
5	Buteo rufinus*	Common Sorecar	+	+	+	-
6	Falco subbuteo	Falcon swallows	+	+	+	-
7	Falco cherrug*	The Falcon Danube	+	+	+	-
8	Coturnix coturnix	Quail	-	-	-	+
9	Burhinus oedicnemus*	The bird field	+	-	-	+
10	Caprimulgus europaeus*	Caprimurg	+	-	-	-
11	Merops apiaster	Prigorie	-	+	+	-
12	Coracias garrulus*	Dumbrăveanca	-	-	+	-
13	Upupa epops	Pupăza	-	-	+	-
14	Jynx torquilla	Capantortura	-	-	+	-
15	Melanocorypha calandra*	The baragan Ciocarlia	-	-	+	+
16	Alauda arvensis	Field Ciocarlie	-	-	-	+
17	Anthus campestris*	Fasa de câmp	-	-	-	+
18	Motacilla flava	Codobatura yellow	-	-	-	+
19	Phoenicurus ochruros	The mountain Codros	-	-	-	-
20	Oriolus oriolus	Grangur	-	+	-	-
21	Lanius collurio*	Sfrancioc roșiatic	-	-	+	+
22	Lanius minor*	Sfrancioc cu fruntea neagră	-	-	+	+
23	Sturnus vulgaris	Graur	-	+	-	-
24	Calandrella brachydactyla*	Ciocârlia de stol	-	-	+	+
25	Dendrocopos syriacus*	Ciocanitoarea Garden	-	-	-	-
26	Lullula arborea*	The forest Ciocârlie	-	-	-	-
27	Pernis apivorus*	Viespar	+	+	+	-
28	Haliaeetus albicilla*	Codalb	+	+	-	-
29	Coccothraustes coccothraustes	Botgros	-	-	-	-
30	Falco tinnunculus	Vânturel rosu	+	+	+	-
31	Miliaria calandra	Presura sură	-	-	-	-
32	Serinus serinus	Canaras	-	-	-	-

33	Streptopelia turtur	Turturica	+	+	-	-

The legend:
+ significant effect;
- insignificant effect.

Having regard to that, of the 33 species of birds of the protected area ROSPA Bestepe0009 - Mahmudia, taken in the study of the wind parks area used for transit, feeding or nesting can it be said that the impact of the wind parks significant negative is one of the following reasons:

- barrier effect would be felt for 12 of the 33 species (36,36%)
- risk of collision is raised for 14 of the 33 species (42,42%)
- loss feeding territory will affect 16 of the 33 species (48,48%)
- In respect of the species concerned, a turbine eoliena and installations of the annexs thereto may have most often one of the following types of negative impact:
- the mortality caused by the moving components of the wind turbine (at the stage of its exploitation);
- the mortality of poultry caused by collision with fixed components of the wind turbine (the tower to support the nacelle) or of the infrastructure relating thereto (pillars and cables on the transport of electric current);
- damage or destruction of natural habitats (at the stage of the fitting out of the platform on which will be assembled wind turbine, etc.);
- disturbance of the birds, because of the noise from the period of operation of the wind turbines and - in less measure - in the shadow of the blades in motion;
- other types of impact Physical type (such as injuries caused by ice on the movable parts).

Activities in the field of wind power can be regarded as a process antropogenic elements found in a possible direct correlation with the decrease of populations (in the event, with the extinction of wild species), from this point of view, the following types of bodies being the most vulnerable:

- Small populations (more exposed to the trials stohastice as regards populationala dynamics, local disasters, the low rate of adaptability, mutagenicity phenomena). Increased risk of extinction is present in the case of the species with complex, low density populationala reduced. The most relevant example in this respect is the herd cuibaritor Ravenclaw Danube (Falco cherrug) in the Dobrogea, composed of only three pairs (reconfirmate cuibaritoare during the period 2008 - 2012).
- Species belonging to the upper trophic levels (located at the top of the pyramids, as is the case in the trophic rapitoarelor daylight) are more vulnerable to the cumulative effects resulting from the factors disturbanti;
- Species with low rate of growth (development), with the sexual maturing late are able, in no small measure, to compensate for any increase in the mortality rate and as a result are more vulnerable to extinction. In this class may be assigned the species of prey daylight, especially if we take into account the reduced number of eggs/Ponta (in comparison with the species of birds from other groups Gymnospermae);
- Species with complex social structures as regards the pairing, feeding in the group or defense in the group are more vulnerable to extinction because their existence depends on the colony. Also features which are characteristic of the colonial species (pelicans, vanturel evening, etc.), namely those who eat in the group (garlite, red-necked geese, common pelican, etc.).
- Species in respect of which copies have a territory larger individually are particularly vulnerable to destruction or degradation of the habitats, as well as the edge asanumitul "effect". In this

category fits in the first row rapitoarele with large dimensions (6 eagles, tangible vulturi).

Diurnal species may be more exposed to the risk of extinction in the case in which have larger dimensions tangible assets (such as pelicanii, geese, swans, acvilele, vulturii), are social species (e.g. common garlite pelicans, geese), shows the high rate of losses due pradatorismului or have large territory individually (generally large rapitoarele) - in general, species with larger dimensions tangible assets usually have a population density lower life cycle more "slow" and territory individually. The decline of a species influence biocenozele (communities of organisms) from forming part according to the role that species in the Community. As a result, the decline of species of biocenoze key has a large impact on the functioning of the entire ecosystem. Such species are primarily rapitoarele daylight, but in the category of key species and species may be included in other environmental groups (for example, pelicanii). In general her predatory species (which carries a 'control' on the Community) may be regarded as the key species, both in natural ecosystems and more powerful systems influenced by anthropic factor. Pelicanii and the various species

1.2. The impact of the wind parks on birds of protected areas - case study the site of community importance Rospa Bestepe0009 – Mahmudia

The site ROSPA0009 - actual Bestepe Mahmudia hosts important bird species protected at European level by directive, poultry and the Bonn Convention, as well as at national level by government decree 57/2007 of which:

1. Bird species listed in Annex I to Council Directive2009/147/EC: *Accipiter brevipes, Anthus campestris, Aquila clanga, Aquila heliaca, Aquila pomarina, Branta ruficollis, Calandrella brachydactyla, Caprimulgus europaeus, Circus cyaneus, Circus macrourus, Coracias garrulus, Dendrocopos syriacus, Falco peregrinus, Falco vespertinus ,Lanius collurio ,Lanius minor, Lullula arborea, Melanocorypha calandra, Burhinus oedicnemus, Buteo rufinus, Circus pygargus, Hieraaetus pennatus, Milvus migrans, Oenanthe pleschanka, Pernis apivorus, Circaetus gallicus, Ciconia ciconia, Circus aeruginosus, Falco cherrug, Haliaeetus albicilla;*

2. Species of birds with regular migration not listed in Annex I to Council Directive 2009/147/EC: *Galerida cristata, Alauda arvensis, Anthus trivialis, Asio otus, Coccothraustes coccothraustes, Coturnix coturnix, Columba palumbus, Cuculus canorus, Falco subbuteo, Falco tinnunculus, Hirundo rustica, Jynx torquilla, Luscinia megarhynchos, Merops apiaster, Miliaria calandra, Monticola saxatilis, Motacilla alba, Motacilla flava, Oenanthe oenanthe, Oriolus oriolus, Phoenicurus ochruros, Riparia riparia, Saxicola torquata, Serinus serinus, Streptopelia turtur, Sturnus vulgaris, Sturnus roseus, Sylvia atricapilla, Sylvia borin, Sylvia communis, Upupa epops, Buteo buteo.*

The site is important for the populations of the following species: cuibaritoare Burhinus oedicnemus, Caprimulgus europaeus, Calandrella brachydactyla, Oenanthe pleschank. The site is important in the migration period for the species of the predatory (the site is bottle-neck for the predatory).

2. CONCLUSIONS

Wind energy is a source of renewable energy, and in rapid growth, both in the areas of land and marine areas.

A wind system is a device that converts the wind energy into electrical energy which will be used to provide power to a lens or transmitted in the mains.

Wind generators shall be classified according to the orientation of the tool's axis of rotation in:

- wind turbines with horizontal axis;
- wind turbines with vertical shaft;

An effect - which may be received and at greater distances, so many locals neighbors wind park - is the phenomenon of flicker (flicker) of the blades when they are illuminated directly or indirectly by the sun,

the effect of which would be stupid for the population of the area.

Wind Parks have an impact on migratory species in both the construction phase, in respect of loss or habitat degradation, hassle habitat, as well as in the operating phase, through direct mortality and clutter.

In general, wind power plants may show the following potential hazards for birds:

• disturbance and changing the flight routes;
• loss of habitats;
• mortalities occur due to collision with the wind turbines;

Birds which bypass the wind turbines during migration or flies over their avoiding them, will be obliged to resort to a higher energy consumption, which may influence their rate of survival.

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- the loss of nest sites will affect the 9 of the 33 species (27,27%)

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