Additional study

regarding birds and bats impact assessment of the

Dorobantu –Topolog wind farm

2013

INTELLECTUAL PROPERTY

Additional study regarding birds and bats impact assessment of the Dorobantu –Topolog wind farm

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2013

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CONTENT

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1. INTRODUCTION

The purpose of the present study is evaluating the impact on the avifauna and chiropterofauna resulting from developing the project titled "***BUILDING OF THE WIND FARM DOROBANTU-TOPOLOG outside the built-up area of communes Dorobantu, Topolog, Casimcea, Tulcea County, Romania"***.

The present study bases its findings on field observations carried out between January 2012 and June 2013, and on information contained in the NATURA2000 standardized forms for the sites of community interest found within the studied area, but also on reports and studies regarding the area published over the years.

In elaborating the study, the team took into consideration compliance with European environment legislation, EU Guidance on wind energy development in accordance with the EU nature legislation, EBRD environment policies, and the Scottish Natural Heritage Guidance, „Survey methods for use in assessing the impacts of onshore wind farms on bird communities".

The importance of this study stems from its utility in decision making by regulating authorities and financial institutions, as well as in informing the interested public regarding the impact of the analyzed project upon the avifauna.

We find it necessary to point out that the present study comes in continuation of evaluation project regarding impact on biodiversity initiated already in 2008, carried on simultaneously with the work on the Environmental Impact Reports, as part of the procedures for obtaining the Environment Accord. A further important point in evaluating the impact of the Dorobantu-Topolog wind farm on biodiversity are the 2010 Appropriate Assessment Study and Environmental Report, on the basis of which the Environmental Permit was granted by the authorities responsible. The recommendations and proposals in these studies formed the basis of monitoring reports demanded by, and submitted to, the local Environmental Agency, in agreement with national level environment protection procedures.

1.1. Description of the structure of the document

The characteristics of the wind farm are reported in Chapter 2, while general features of the potentially affected Natura 2000 sites are reported in Chapter 3.

The criteria adopted for the design of the field survey activities are described in Chapter 4, with the identification of the target species and the presentation of the overall field activities actually carried out. In Chapter 5 the baseline is described, assessing each species of interest and reporting both results from the desktop analysis/literature review and field survey.

Finally, impact assessment is discussed in Chapter 6.

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2. PROJECT DESCRIPTION

2.1. Wind farm location

Dorobantu-Topolog windfarm is located in the Dobrogea region, in South-Western Tulcea, in area of the the villages: Dorobantu Mesteru and Luminita. The approximate distances, measured in a straight line, from the main urban areas from the region are:

- aprox. 44 km from Tulcea;
- aprox 77 km from Constanta.

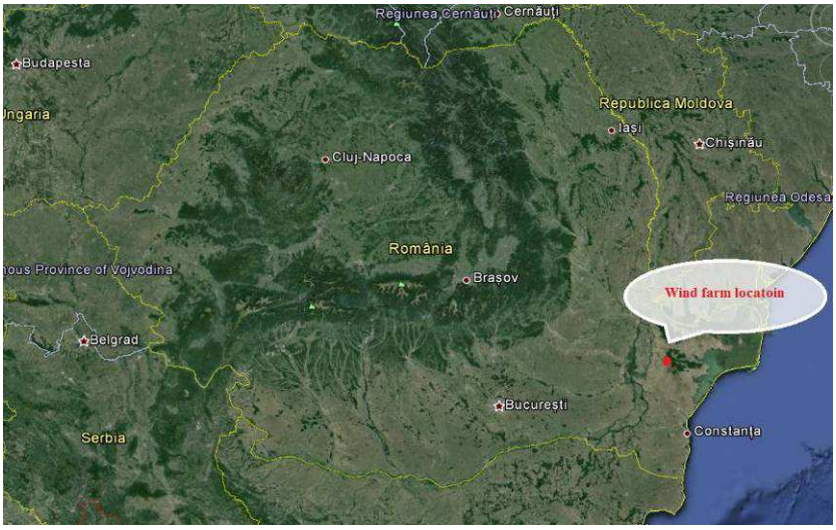

Figure 1. Site location - national (map source: Google Earth)

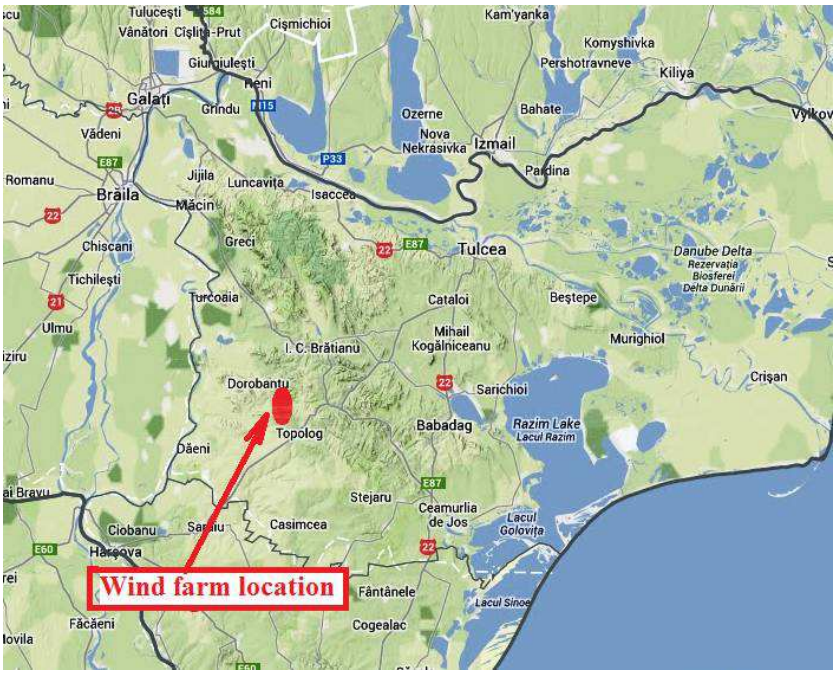

Figure 2. Site location- local (Tulcea County) map source: www.biodiversitate.mmediu.ro

The project ***"BUILDING OF THE WIND FARM DOROBANTU-TOPOLOG outside the built-up area of communes Dorobantu, Topolog, Casimcea, Tulcea County, Romania"*** has as a purpose the development of a wind farm consisting of 42 VESTAS V 90 – 2 MW turbines,

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which produce electric power from non-conventional sources of (wind) power, with a total power of 84 MW, with the related additional installations. This project is divided in three sub-farms:

- Sub-project Mesteru (ME) – 16 wind turbines;
- Sub-project Luminita (LU) - 11 wind turbines;
- Sub-project Topolog (TO) - 15 wind turbines.

Underground power grids of 30 kV and 110 kV and a 30/110 kV Topolog transformer station will be also built in.

Figure 3. Satellite view of the location of the wind turbines (map source: Google Earth)

The access to the location is performed on the county road 222 B and on the network of communal roads and service roads.

The distance up to the nearest rural settlement (Topolog locality) is of about 500 m, measured in straight line.

The wind turbines will be located on a land with a total surface of 497 ha.

The affected land surface will consist of:

- 10,08 ha, corresponding to the technologic platforms
- 714 sqm corresponding to the turbines, because the foundations are embedded, only the pillar remains on the surface of the land, with the diameter of 4,65 m.
- 191,52 sqm the surface affected by the power plants
- 56.895 sqm corresponding to the new access roads to the turbines
- 7.300 sqm the surface of the transformer power plant 30/110 kV Topolog.

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General specifications of V90 2 MW wind turbine

The Vestas V90-1.8/2.0 MW wind turbine is a pitch regulated upwind turbine with active yaw and a three-blade rotor. The Vestas V90 2.0 MW turbine has a rotor diameter of 90 m with a generator rated at 2.0 MW, depending on wind conditions. The turbine utilizes a microprocessor pitch control system called OptiTip® and the OptiSpeed TM (variable speed) feature. With these features, the wind turbine is able to operate the rotor at variable speed (rpm), helping to maintain the output at or near rated power.

The V90 2.0 MW is equipped with a 90-meter rotor consisting of three blades and the hub. Based on the prevailing wind conditions, the blades are continuously positioned to help optimize the pitch angle.

Rotor	
Diameter	90 m
Swept Area	6362 m2
Rotational Speed Static, Rotor	14,9 rpm
Speed, Dynamic , Operation, Range	9,6 – 17,0 rpm
Rotational Direction	clockwise (front view)
Orientation	upwind
Tilt	6°
Hub Coning	2°
Number of Blades	3
Aerodynamic Brakes	Full feathering

The 44 m *Prepreg (PP) blades* are made of carbon and fiber glass. They consist of two airfoil shells bonded to a supporting beam.

PP Blades	
Type Description	Airfoil shells bonded to supporting beam
Blade Length	44 m
Material	Fiber glass reinforced epoxy and carbon fibers
Blade Connection	Steel roots inserts
Air Foils	RISØ P + FFA – W3
Maximum chord	3,512 m
Blade tip (R44.5)	0,391 m
Twist (blade root/ blade tip)	27°
Approximate weight	6750 kg

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Pitch system

The energy input from the wind to the turbine is adjusted by pitching the blades according to the control strategy. The pitch system also works as the primary brake system by pitching the blades out of the wind. This causes the rotor to idle. Double-row four-point contact ball bearings are used to connect the blades to the hub. The pitch system relies on hydraulics and uses a cylinder to pitch each blade. Hydraulic power is supplied to the cylinder from the hydraulic power unit in the nacelle through the main gearbox and the main shaft via a rotating transfer. Hydraulic accumulators inside the rotor hub ensure sufficient power to pitch the turbine in case of failure.

Pitch System	
Type	Hydraulic
Cylinder	Ø125/80 – 760
Number	1 piece/ blade
Range	-5º to 90º

Hydraulic system	
Pump capacity	44 l/min.
Working pressure	180 – 200 bar
Oil quantity	260 l
Motor	18,5 kW

Hub

The hub supports the three blades and transfers the reaction forces to the main bearing. The hub structure also supports blade bearings and pitch cylinder.

Hub	
Type	Cast ball shell hub
Material	Cast iron EN GJS 400-18U-LT/EN 1560

Operational envelope- temperature and wind

Values refer to hub height and are determined by the sensors and control system of the turbine.

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Operational Envelope – Temperature and Wind	
Ambient Temperature Interval (Standard Temperature Turbine)	-20° to +40° C
Cut -In (10 Minute Average	4 m/s
Cut -Out (100 Seconds Exponential Average)	25 m/s
Re-Cut In (100 Seconds Exponential Average	20 m/s

Structural Design – Illustration of Outer Dimensions

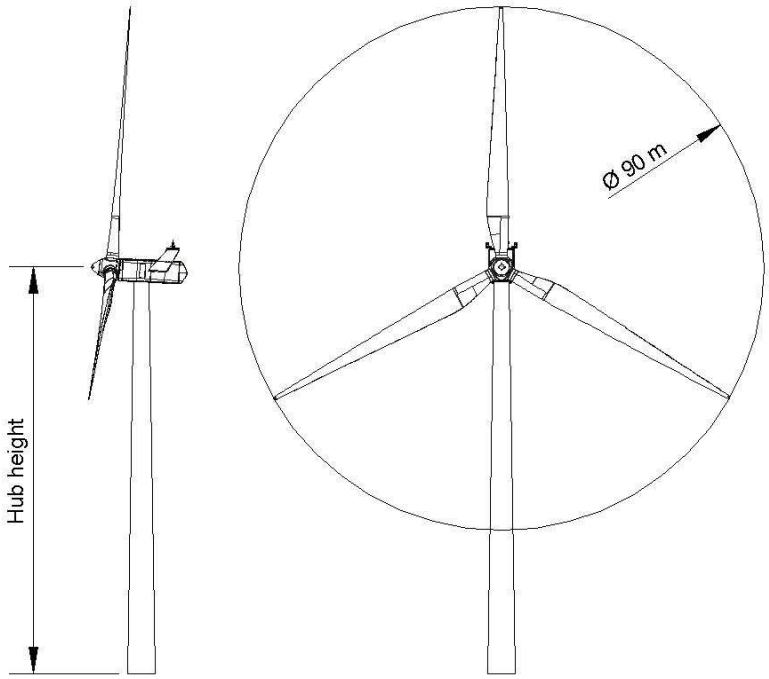

Figure 4. General diagram of a wind turbine

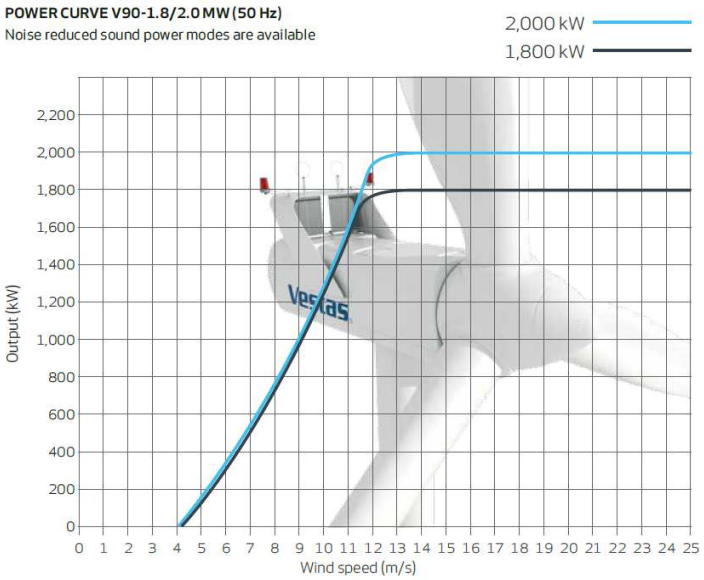

Figure 5. Power curve of Vestas V90

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2.2. Existing environment features in the wind park

2.2.1. Geological and relief features of the site area

The location of the wind farm Dorobantu-Toplog is in the Dobrogea Region (Romania), at the limit between *North Dobrogea Plateau* (Dorobantu Commune) and *Central Dobrogea Plateau* (Topolog Commune), with the sub-divisions Babadag Plateau and Casimcea Plateau.

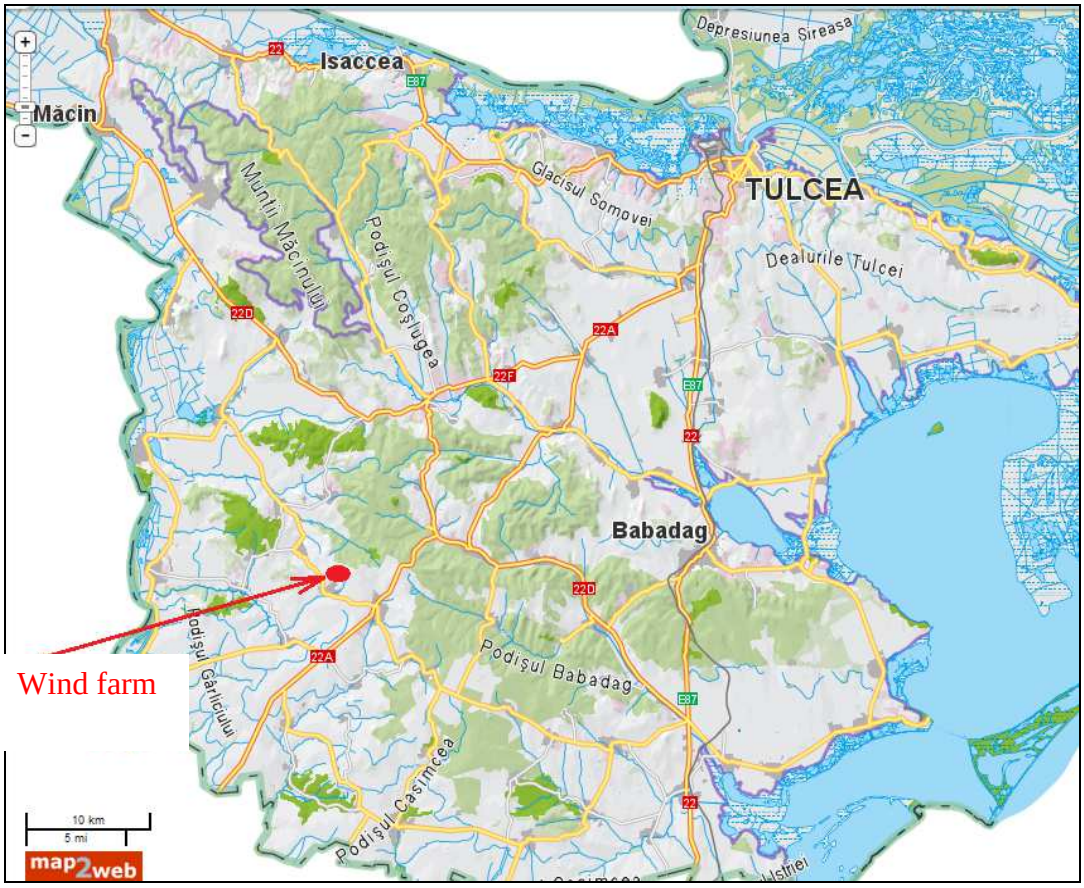

Figure 6. *Physical map*– location of the wind farm - map source: tulcea-county.map2web.eu

Casimcea Plateau includes crests and plateaus, slightly convex, sometimes having the shape of large domes separated by large paths, located in the Northern part, where they form the interfluves towards the hydrographical basins of Aiorman and Slava, and in the central part of the plateau, where they constitute the main interfluves in the hydrographical basins of the rivers Topolog and Casimcea.

On some sectors, the deep valleys in the mass of the green schists have an aspect of canyons, such as Topologului Valley, between Haidar and Calfa. At the beginning of Topolog, upstream the valley sector in the canyon, the Topolog – Sambata Noua Depression is shaped, relatively high (200-250 m), reduced from the point of view of the surface, and in which we can find long versants, with reduced slopes, of the type of glacises of erosion.

The base of the Jurassic limestones, present in the South extremity of the plateau, introduces a particular note in the geomorphological view, in contrast with its whole image.

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Babadag Plateau is similar to a massive platform, partially fragmented by not so deep and short valleys, oriented towards the North-East. It is delimited to the North by Cernei Depression, then by the Taitei corridor and Babadag Lake, and to the South by Pecineaga – Camena fault. The high platforms of Danube can be found to the West, and the not so high Depression of Jurilovca to the East.

The deposits of Babadag Plateau mostly belong to the Superior Cretaceous period, being represented by sandy limestone, conglomeratic limestone, limy sandstones, marl lime. These formations are covered with a blanket which ends at the surface through a loess layer.

The area Dorobantu – Mesteru – Topolog presents as characteristic relief with the form of some hilly formations, having as characteristic elements a fundament represented by old, weathered Proterozoic deposits and a sedimentary coating consisting of Quaternary blanket deposits, mostly represented by loess from the wind deposit.

The types of soils present on the location are mainly represented by black earths (carbonatic, leachated, brown and chocolate).

2.2.2. Climatic characteristics

Dorobantu and Topolog Communes have a continental climate with hot and dry summers, frosty winters with permanent winds, with big temperature differences from day to day. The yearly average temperature is 10^0 – 11^0C, the maximum temperature in the summer is 37^0C. The average quantity of precipitations is of 400 mm/sqm yearly.

The territory is located in an area with strong winds, on the N-S direction.

Casimcea Commune is characterized by a continental climate with high temperatures in July and cold winters. The average yearly temperature is of 11^0 C and the average quantity of precipitations is of 480 mm/sqm annually.

The convective movements of the instable air masses produced in the atmospheric storms generate electric phenomena accompanied by lightning and thunders. The annual average number of days of lightning and thunders is of about 12. These processes are frequent in the months May-June.

The following meteorological parameters were registered in the area of the wind farm. in the studied period (January 2012– June 2013):

- The minimum average temperature was recorded in January 2012 and the maximum in July 2012;

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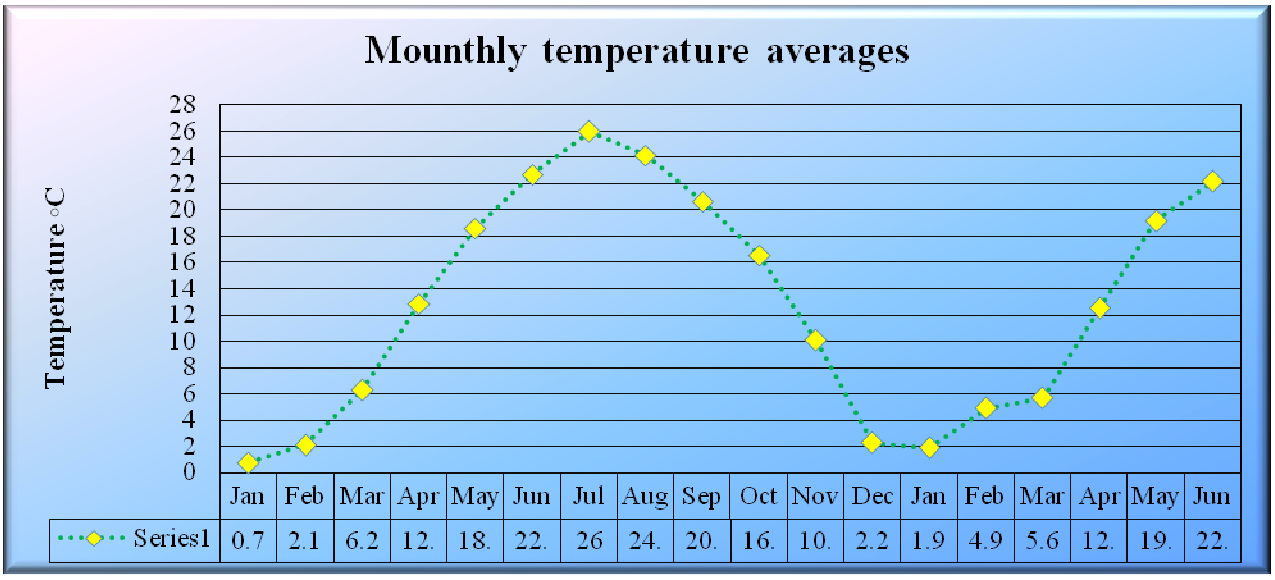

Figure 7. Mounthly temperature average

- The minimum average of the volume of precipitations was recorded in July 2012 and the maximum in January 2012;

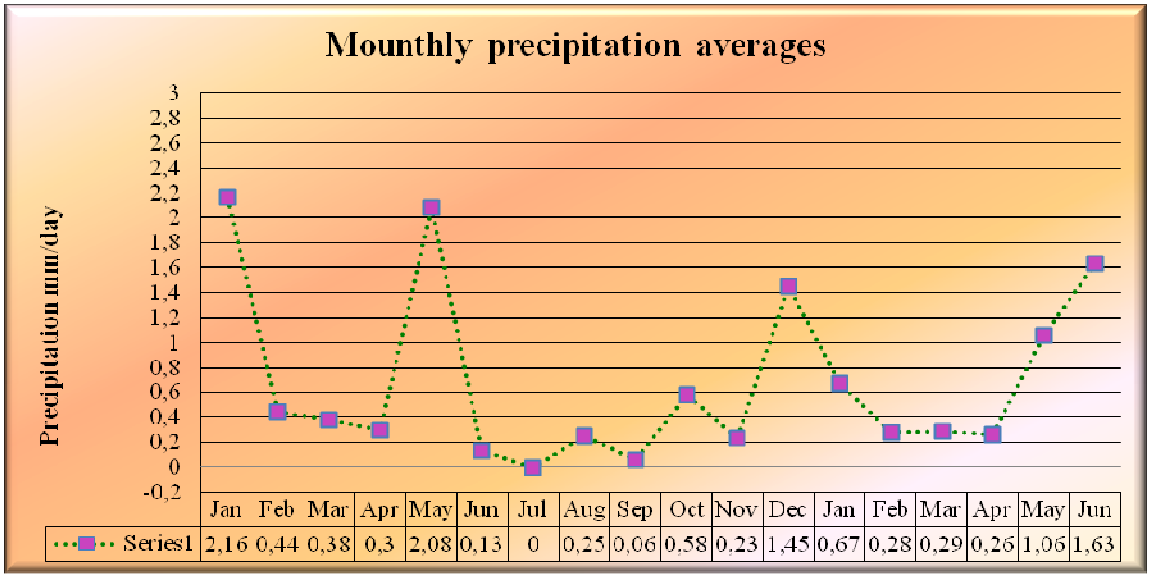

Figure 8. Mounthly precipitation average

Figure 8 was completed through calculating the arithmetic mean of daily rainfall values, measured in mm (where 1mm=1l/m2), separately for each month between January 2012 and June 2013.

Larger values are the daily ones, such as those in the months of January and October with values of 15mm and with a maximum of 49mm in the month of May 2012. Generally, monthly precipitations in Tulcea District for the year 2012 were reduced, this year was a dry one for the Tulcea District. For the year 2013, maximum daily values were recorded in the months of: May, with 18mm and June, with 41mm.

2.2.3. Hydrological characteristics

On the location proposed for the operation of the wind farm, there are no important permanent or temporary watercourse.

There are many watercourses with a permanent character in the vicinity of the wind farm, Topolog, Valea Rostilor, Peceneaga as well as many streams with intermittent water, conditioned by the volume of the precipitations.

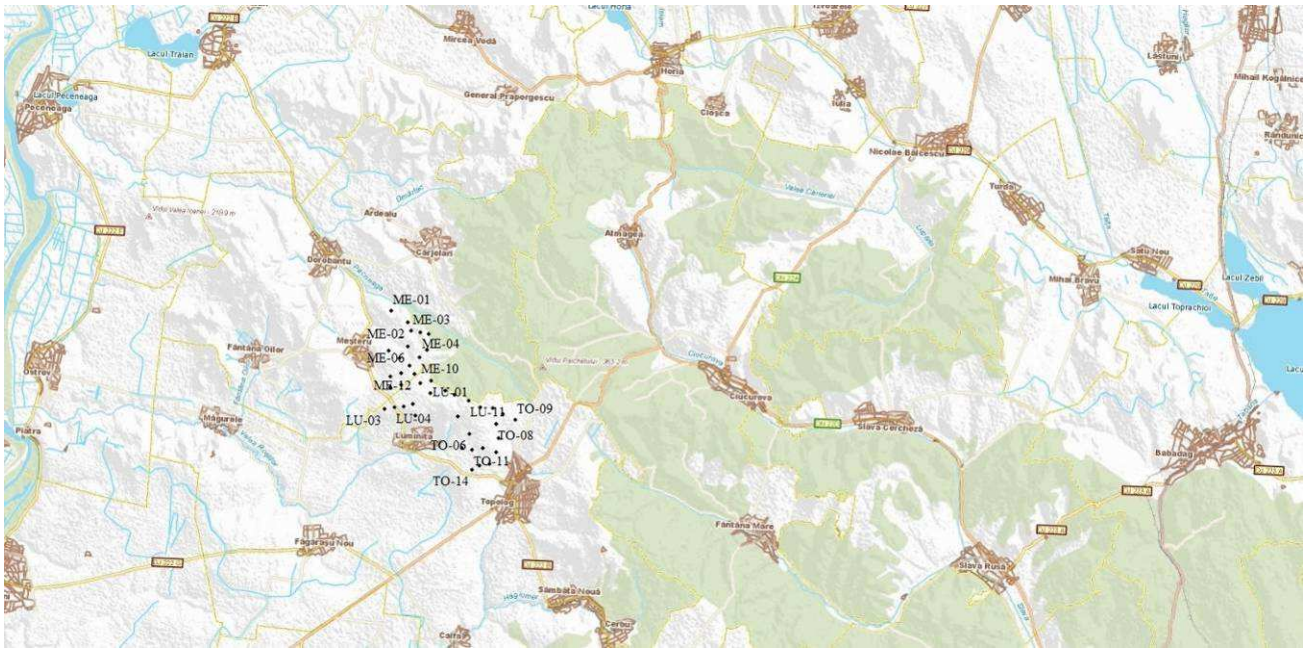

Figure 9. The hydrographic network from the South West of Tulcea County

The most important watercourse is Topolog River, which springs from Casimcea Plateau, near Topolog Village, Tulcea County, with a generally permanent regimen, but with a torrential character.

The course of the river is initially orientated from North-West to South-East, it changes its direction to the West, downstream, and has a total length of 38 km, out of which 20 km are within Tulcea County, and the rest in Constanta County. The total surface of the hydrographical basin is of 343 km^2, out of which 165 km^2 are in Tulcea County, and the rest in Constanta County.

The location of the analyzed wind farm is situated at a distance of about 13.5 km from the Danube River – the most important watercourse which delimits Dobrogea region.

2.2.4. The main types of habitats

The studied area combines elements characteristic of pastoral, rural and sylvan landscape which, along with a hilly landscape, creates a unique and complex landscape, affected only in patches by the presence of roads and electrical lines.

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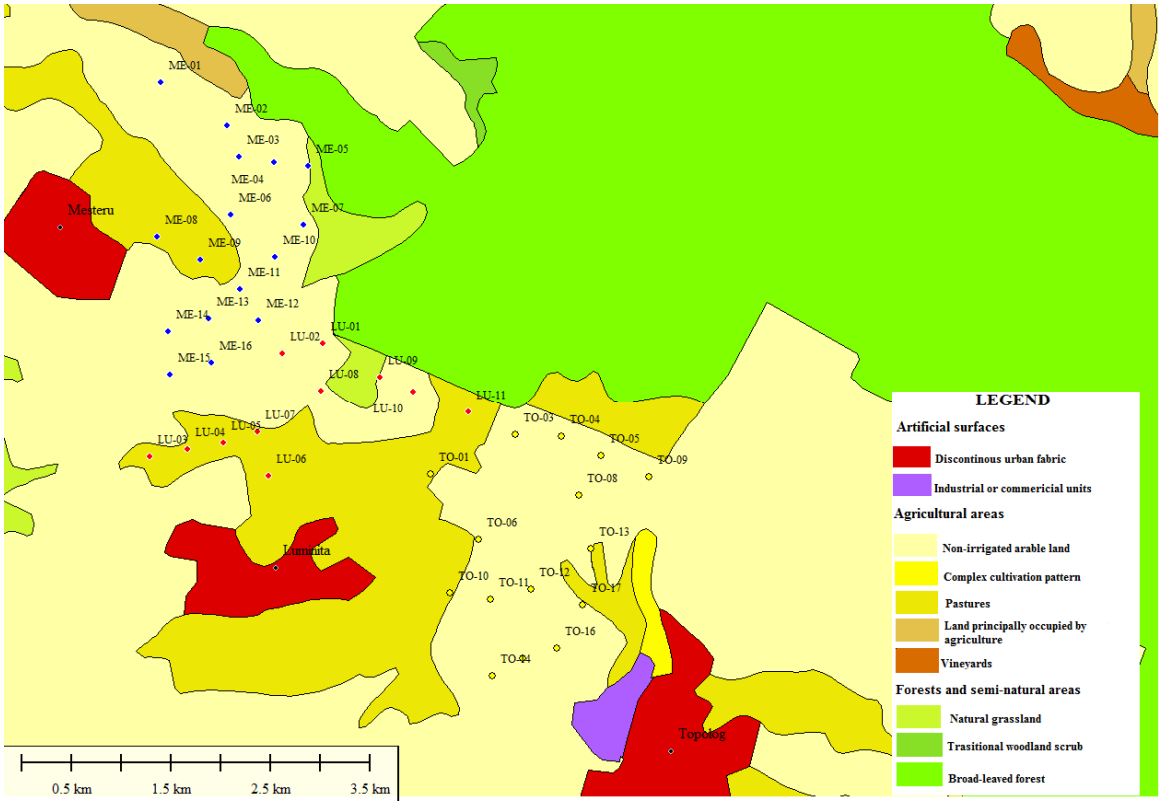

Figure 10. The main types of land use from the area studied and its vicinities (taken from Corine Land Cover 2006)

The vegetation structure from the area studied is the result of the action of the environmental factors over time, from which we mention: the continental climate, the poor hydrographic network, the interspecific competition and the anthropogenic factor.

The areas for the implementation of the wind farm is represented by arable and grazing land, anthropic habitats (of agro ecosystem type) which alternate here and there with semi-natural habitats, respectively secondary steppe grasslands, anthropo-zoogenous, with a floristic structure close to the Romanian habitats **R3415 Ponto-Balkan grass lands of *Botriochloa ischaemum* and *Festuca valesiaca* coresponding to Natura 2000 habitat: 6240***Sub-pannonic steppe grasslands (D.Gafta, O.Mountford, 2008**) and R3420 West-Pontic grass lands of *Poa bulbosa, Artemisia austriaca, Cynodon dactylon* and *Poa angustifolia* coresponding to Natura 2000 habitat 62C0*** Ponto-Sarmatian steppes (D.Gafta, O.Mountford, 2008**).**

We must note that the steppe vegetation shows an advanced stage of degradation, due to prolonged and unrestricted grazing, deeply altering the cenote structure of the habitats.

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Figure 11. View of the agro ecosystems

The Ponto-Balkan habitat of *Botriochloa ischaemum* and *Festuca valesiaca* represents the lowland pastures from the steppes and forest-steppes of the hills in the area of the oak forests from Dobrogea, Muntenia and Southern Moldova. Characteristic of this type of habitat are xerophile, steppe gramineae, which form the upper floor of 50-65 cm, with a 60-85% coverage. Of these plants, the ones always present in the phytocoenoses are: *Botriochloa ischaemum*, *Festuca valesiaca*, *Bromus hordeaceus*, *Agropyron cristatum*, *A. repens*, *Chrysopogon gryllus*, *Stipa capillata*, *S. lessingiana*, *Astragalus onobrychis*, *Artemisia austriaca*, *Achillea setacea*. The floristic composition of the R3415 habitat consists of the following edifying species : *Festuca valesiaca*, *Botriochloa ischaemum* and characteristic species: *Botriochloa ischaemum*, *Festuca valesiaca*, *F. rupicola*. Other species important for this type of habitat: *Taraxacum serotinum*, *Daucus guttatus*, *Galium humifusum*, *Artemisia austriaca*, *Chrysopogon gryllus*, *Adonis vernalis*, *Veronica austriaca* ssp. *jacquinii*, *Salvia nutans*, *Inula oculus-christi*, *Centaurea rutifolia* ssp. *jurineifolia*, *Teucrium polium*, *Asperula cynanchica*, *Eryngium campestre*, *Euphorbia seguieriana*, *Achillea setacea*, *Potentilla argentea*, *Astragalus onobrychis*, *Trifolium campestre*, *Medicago lupulina*, *Cynodon dactylon*, *Kochia prostrata*.

Figure 12. Grassland with *Botriochloa iscaemum*

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The West-Pontic grasslands habitat of *Poa bulbosa, Artemisia austriaca*, *Cynodon dactylon* şi *Poa angustifolia* represents the 500–600 ha pastures, with decayed vegetation, spread in Eastern Muntenia, Dobrogea, Southern Moldova, reach maximum development in spring, when the soil has enough humidity for the growth of the vegetation. In early summer, the characteristic species enters rest and *Artemisia austriaca*, a xerophylous species, appears massively, and lasts until autumn. *Cynodon dactylon, Festuca valesiaca, Agropyron cristatum, Lolium perenne, Bromus tectorum, Medicago lupulina, M. minima, Poa angustifolia*. The accompanying plants are numerous and belong to the original vegetation that existed on these lands (Donita N., 2005), such as: *Coronilla varia, Euphorbia glareosa, E. seguieriana, Lotus corniculatus, Galium humifusum, Ceratocarpus arenarius*.

Figure 13. Grassland with *Poa bulbosa*

In the vicinity of the location, besides the habitats specific to the agroecosystems, a series of semi-natural and natural forestry habitats where found. From the natural habitats of community importance, we mention the habitat **91M0 Pannonian-Balkanic turkey oak- sessile oak forest,** very extensive in the area of Babadag Plateau, with the representative associations *Querco pedunculiflorae-Tilietum tomentosae* Donita 1970 and *Nectaroscordo - Tilietum tomentosae* Donita 1970, and also the habitat **91AA* Eastern white oak woods** represented through the association *Galio dasypodi - Quercetum pubescentis* Donita 1970 (Petrescu, M., 2007).

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Figure 14. View of the forestry ecosystem – habitat 91M0

The *Querco pedunculiflorae-Tilietum tomentosae* association corresponds to the Romanian habitat R4158 Danubian-West Pontic mixed forests of gray oak (*Quercus pedunculiflora*) and silver lime (*Tilia tomentosa*) with *Viola jordanii*. This habitat is represented by mixed xero-mesophile, neutrophile, *Quercus pedunculiflora* from the North Dobrogea Plateau, accompanied by species from the arborescent layer: *Tilia tomentosa*, *Carpinus orientalis*, *Carpinus betulus*, *Fraxinus excelsior*, *Fraxinus ornus.*

The *Nectaroscordo-Tilietum tomentosae* association corresponds to the Romanian habitat R4136 West Pontic mixed forests of sessile oak (*Quercus petraea*), silver lime (*Tilia tomentosa*) and hornbeam (*Carpinus orientalis*) with *Nectaroscordum siculum*. This habitat is represented by mixed xero-mesophile, neutrophile, *Quercus dalechampii* and *Q. polycarpa* forests from the plateaus of North Dobrogea, with *Tilia tomentosa*, *Carpinus orientalis*, *Carpinus betulus*, *Fraxinus excelsior*, *Fraxinus coriariifolia*, *Fraxinus ornus*, accompanied by numerous Mediterranean species in the herbaceous layer.

The *Galio dasypodi-Quercetum pubescentis* association corresponds to the Romanian R4161 West-Pontic forests-clearings of pubescent oak (Quercus pubescens) with *Galium dasypodum* and is representative for xerophile, neutrophile forests, of *Quercus pubescens* from the limestone plateaus of Dobrogea.

Also, in the vicinity of the wind farm, bordering the already mentioned forestry habitats, areas of thickets were identified, representative for them being the association *Pruno spinosae - Crataegetum* Soo (1927) 193, included in the habitat **40CO* Pontic-Sarmatian Deciduous Thickets** or habitat R3122, corresponding classification of Romanian habitats. (N. Donita et al., 2005).

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These shrubs belong to the Southern forest-steppe of the Ponto-Sarmatian region and are spread in its South-West area, in Moldova, Muntenia and Dobrogea. The floristic composition is given by the following species: *Prunus spinosa*, *Crataegus monogyna*, as edifying species and by other important taxa such as: Rubus *caesius*, *Rosa canina*, *Evonymus verrucosus*, *Pyrus pyraster*, *Ligustrum vulgare*, *Rhamnus cathartica*, *Humulus lupulus*, *Clematis vitalba*, *Cornus sanguinea*, *Evonymus europaeus*, *Rosa gallica*, *Prunus fruticosa*, *Veronica chamaedrys*, *Plantago media*, *Jasminum fruticans*, *Amygdalus nana*, *Cornus mas*, *Vicia tenuifolia*, *Bromus inermis*, *Origanum vulgare*, *Asparagus verticilatus*, *Festuca valesiaca*, *Poa angustifolia*, *Poa bulbosa*, *Dactylis glomerata*, *Agropyron repens*, *Agrimonia eupatoria*, *Phleum phleoides*, *Teucrium chamaedrys*.

Figure 15. View of the area with thickets

2.2.6. Positioning of the wind farm in relation to Natura 2000 sites

The wind farm consists of 42 turbines and is located partially within the Protected Areas of Community Interest, as follows:

- 11 turbines inside the ROSCI0201 North Dobrogea Plateau (LU-03, LU-04, LU-05, LU-06, LU-07, LU-08, LU-09, LU-10, LU-11, TO 01, ME – 08);
- One turbine inside the ROSPA0091 Babadag Forest (ME – 08).

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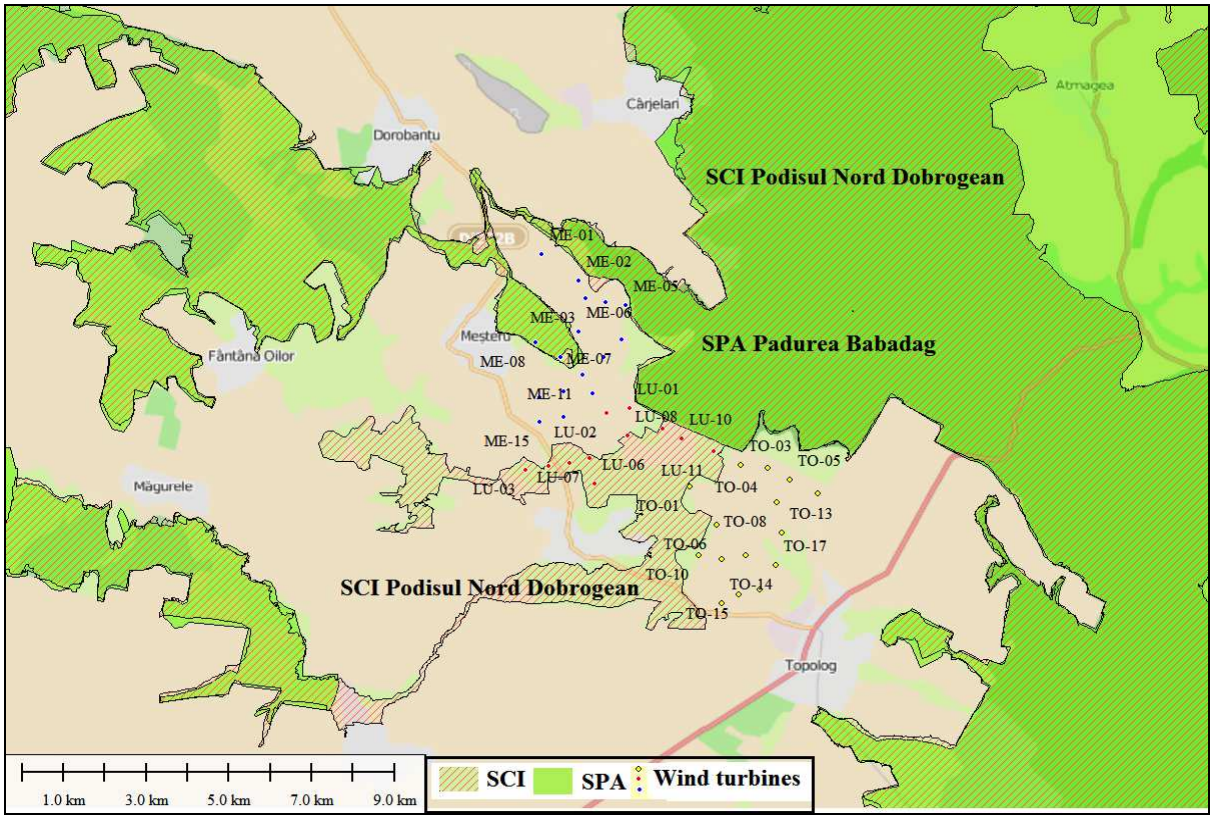

Figure 16. Positioning of the wind turbines in relation with the Protected Areas of Community Interest

Land use in the analyzed area.

Land use type	*Total number turbines*	*Number within SCI*	*Number within SPA*
Non-irrigated arable land	31	0	0
Pastures	11	11	1

The description and the conservation status of the pastures is described at pagg. 77-79 "Information on trends and changing habitats".

Due to recent optimizations, the development of the turbine To-01 (inside the SCI area) was abandoned and consequently the number of turbines was reduced from 42 to 41. According to the final layout, respectively, 10 turbines (LU03 - LU011 and ME08) are located within the SCI Podisul Nord Dobrogean and one of them (ME08) within the SPA Padurea Babadag (the turbine ME-08 is located both in the SCI and in the SPA, since part of the Padurea Babadag SPA is also designated as a SCI).

After abandoning the TO1 turbine, Land Power started the development of a new turbine located outside the Natura 2000. The process in ongoing.

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3. NATURA 2000 SITES DESCRIPTION (based on Natura 2000 Standard Data Form)

The short description of the two sites of Community interest (SCI and SPA) from the area of the wind farm was based on information contained in the standard forms, approved by national legislation (Government Decision no. 1284/2007 modified and completed by GD 971/2011, and the Order of the Minister of Environment and sustainable development no. 1964/2007 as amended by the Order of the Minister of Environment and Forests no. 2387/2011).

3.1. ROSCI 0201 North-Dobrogea Plateau

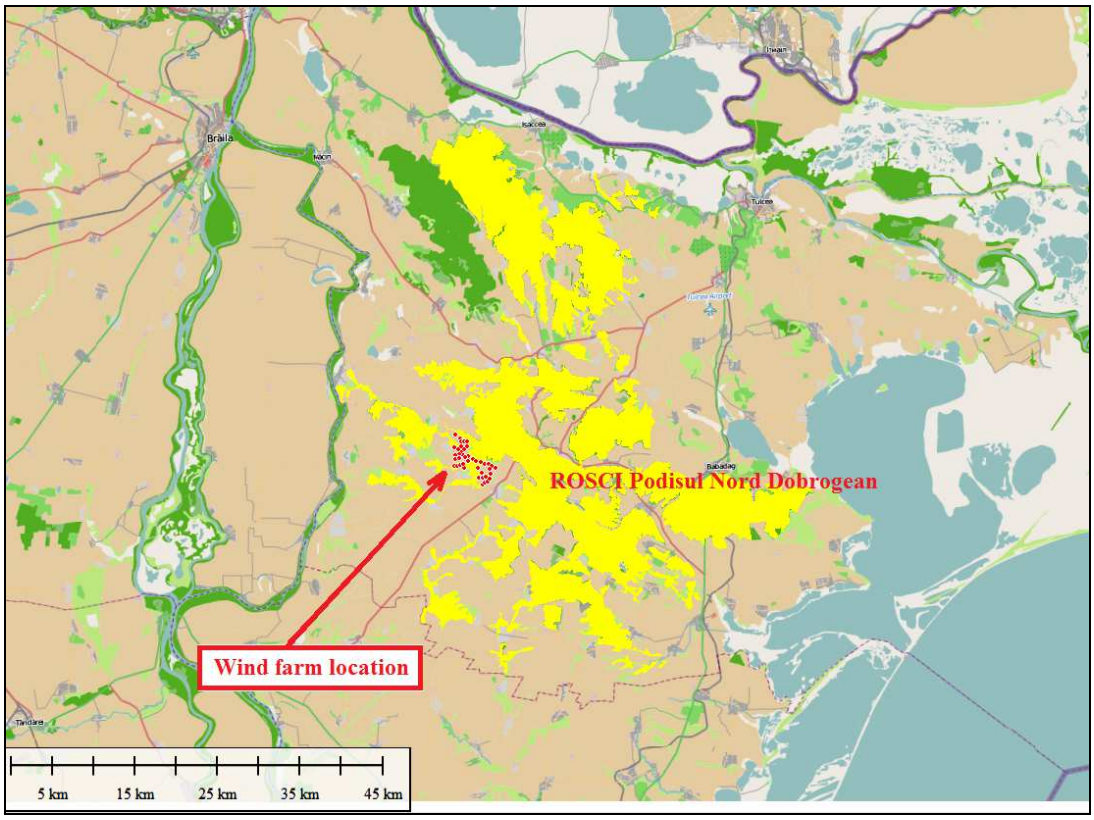

Figure 17. map source: openstreetmap

Relations with other described Natura 2000 sites: ROSPA0040 Dunarea Veche - Bratul Macin, ROSPA0100 Casimcea Steppe, ROSPA0073 Macin – Niculitel, ROSPA0091 Babadag Forest

Region – Dobrogea
County - Tulcea
Biogeographic region - Steppe
Site-center location - N 44° 58’ 13”; E 28° 30’ 7”
Altitude (m): min. 0; max. 411; med. 201
Site Surface Area (ha): 84812
Custodian: it is not attributed to a custodian
Management plan: is not elaborated yet

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Ecological information

Table 1. Habitat types present on the site and site assessment for them

Codes	Habitat types	%	Reprez.	Rel.surf.	Conserv.	Global
40C0*	Ponto-Sarmatic deciduous thickets	2	A	A	B	B
91X0	Dobrogean beech forests	0.01	B	A	B	B
62C0*	Ponto-Sarmatic steppes	27.87	A	A	B	A
91I0*	Euro-Siberian steppic woods with *Quercus* spp.	2.25	A	B	A	A
91M0	Pannonian-Balkanic turkey oak-sessile oak forests	24.7	A	B	B	A
91Y0	Dacian oak-hornbeam forests	23.58	A	B	B	A
91AA*	Eastern white oak woods	17.07	A	A	B	A
92A0	*Salix alba* and *Populus alba* galleries	0.02	C	C	B	C
8310	Caves not open to the public	0.001	C	C	B	C
8230	Siliceous rock with pioneer vegetation of the *Sedo-Scleranthion* or of the *Sedo albi-Veronicion dilleni*	1	B	A	B	B

LEGEND

REPREZENTATIVITY	RELATIVE SURFACE	CONSERVATION STATUS	GLOBAL ASSESSMENT
A - excellent reprezentativity	A - 100 ≥ p > 15 %	A – excellent conservation	A – excellent value
B – good reprezentativity	B - 15 ≥ p > 2 %	B – good conservation	B – good value
C – significant reprezentativity	C - 2 ≥ p > 0 %	C – average or reduced conservation	C – significant value
D – non-significant presence			

Table 2. Mammals species that occur at the site (listed in annex II of Council Directive 92/43/EEC)

Codes	Species	Resident	Breed	Winter	Stage	Population	Conserv.	Isolation	Global
1335	*Spermophilus citellus*	RC				A	A	C	A
1304	*Rhinolophus ferrumequinum*	P				C	B	C	B
2609	*Mesocricetus newtoni*	R				A	B	A	B
2633	*Mustela eversmannii*	V				A	B	B	B
2635	*Vormela peregusna*	V				A	B	B	B
2021	*Sicista subtilis*	P				B	B	A	B

Table 3. Amphibians and reptiles species (listed in annex II of Council Directive 92/43/EEC)

Codes	Species	Resident	Breed	Winter	Stage	Population	Conserv.	Isolation	Global
1188	*Bombina bombina*	P				D			
1219	*Testudo graeca*	RC				A	B	B	A
1279	*Elaphe quatuorlineata*	V				B	B	A	B

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Table 4. Flora species that occur at the site (listed in annex II of Council Directive 92/43/EEC)

Codes	Species	Resident	Breed	Winter	Stage	Population	Conserv.	Isolation	Global
236	*Campanula romanica*	R				A	A	A	A
079	*Moehringia jankae*	V				A	A	A	A
253	*Centaurea jankae*	P?							
327	*Himantoglossum caprinum*	R				A	B	C	B
125	*Potentilla emilii-popii*	P?							
067	*Echium russicum*	V				C	B	C	B
097	*Iris aphylla ssp. hungarica*	V				C	B	C	B

LEGEND					
STATUS	**IUCN**	**POPULATION**	**ISOLATION**	**CONSERVATION**	**GLOBAL**
F - frequent	EN - Endangered	A - 100 p > 15%	A – population (almost) isolated	A - excellent conservation	A - excellent value
R - rare	NT - Near Threatened	B - 15 p > 2%	B – population not isolated, but on margins of area of distribution	B - good conservation	B - good value
RC - relatively common	VU - Vulnerable	C - 2 p > 0%	C – population not isolated within extended distribution range	C - average or reduced conservation	C - significant value
P - present	LC - Least concern	D – insignificant population			
C - common					
A - abundant					
i - individuals					
p - pairs					
IUCN - International Union for Conservation of Nature, Red List of Threatened Animals					
POPULATION: Size and density of the population of the species present on the site in relation to the populations present within national territory. This criterion exists to evaluate the relative size or density of the population in the site with that of the national population.					
CONSERVATION: Degree of conservation of the features of the habitat which are important for the species concerned. And possibilities for restoration.**A.** conservation excellent= elements in an excellent condition, independent of the grading of the possibility of restoration; B. Good conservation= elements well conserved independent of the possibility of restoration,= elements in average or partially degraded condition and restoration easy; C: average or reduced conservation = all other combinations					
ISOLATION: Degree of isolation of the population present on the site in relation to the natural range of the species.					
GLOBAL: Global assessment of the value of the site for conservation of the species concerned.					

Table 5. Other important species of flora

Cat.	Species	Population	Motivation	Cat.	Species	Population	Motivation
P	*Achillea clypeolata*	R	A	P	*Lunaria annua ssp. pachyrhiza*	V	A
P	*Achillea ochroleuca*	R	A	P	*Mercurialis ovata*	C	A
P	*Agropyron cristatum ssp. brandzae*	P	C	P	*Muscari neglectum*	C	A
P	*Anacamptis pyramidalis*	R	A	P	*Myrrhoides nodosa*	C	A
P	*Asparagus verticillatus*	C	A	P	*Nectaroscordum siculum ssp. bulgaricum*	C	A
P	*Asphodeline lutea*	V	A	P	*Neottia nidus-avis*	V	A
P	*Astragalus ponticus*	R	A	P	*Ononis pusilla*	R	A
P	*Asyneuma anthericoides*	V	A	P	*Orchis morio*	R	A
P	*Celtis glabrata*	V	A	P	*Ornithogalum amphibolum*	R	A

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P	*Cephalanthera rubra*	R	A	P	*Paeonia peregrina*	C	A
P	*Corydalis solida ssp. slivenensis*	C	A	P	*Paeonia tenuifolia*	V	A
P	*Crocus chrysanthus*	R	A	P	*Paliurus spina-christi*	V	A
P	*Crocus flavus*	R	A	P	*Paronychia cephalotes*	R	A
P	*Dianthus nardiformis*	R	C	P	*Pimpinella tragium ssp. lithophila*	C	A
P	*Fritillaria orientalis*	V	A	P	*Piptatherum virescens*	C	A
P	*Gagea bulbifera*	V	A	P	*Platanthera chlorantha*	R	A
P	*Gagea szovitsii*	R	A	P	*Rumex tuberosus*	C	A
P	*Galanthus plicatus*	R	A	P	*Salvia aethiopis*	R	A
P	*Globularia bisnagarica*	V	A	P	*Satureja coerulea*	R	A
P	*Goniolimon collinum*	R	A	P	*Scorzonera mollis*	R	A
P	*Gymnospermium altaicum*	R	A	P	*Scutellaria orientalis*	R	A
P	*Himantoglossum hircinum*	V	A	P	*Silene compacta*	R	A
P	*Lactuca viminea*	R	A	P	*Spiraea hypericifolia*	R	A
P	*Lathyrus pannonicus*	R	A	P	*Stachys angustifolia*	R	A
P	*Limodorum abortivum*	V	A	P	*Tanacetum millefolium*	C	A
P	*Thymus zygioides*	C	A	P	*Veratrum nigrum*	R	A

LEGEND	
Population	**Motivation**
C= common; R= rare; V= very rare; P= present	A= National Red Data List; B=endemics; C= International Convention (incl. Bern, Bonn, CBD); D= Other reasons

Site description

General site Character (based on information derived from Corine Land Cover project)

Cod	%	CLC	Habitat classes
N09	5	321	Natural grasslands, steppes
N12	4	211- 213	Agricultural areas (arable land)
N14	10	231	Pastures
N16	73	311	Broad-leaved forests
N26	8	324	Forests habitats (transitional woodland shrub)

Quality and importance

Nationwide (and probability also at a European scale), the site is the most extensive and representative for the steppe bioregions, being formed in a proportion of 95.5% (85 046 ha) of habitats of Community interest, from which steppe habitats (24807ha-27.85%). Forest habitats, also of Community interest, are dominated by the 41.7 Thermophilous and supra- mediterranean oak woods habitat group (which includes types 91IO, 91 MB, 91AA) - 34,000 ha (38.19%), followed by habitat 41.2 (represented by the type 91YO) - 21000ha (23, 591%), other forest habitats having a restricted share, respectively 91XO ha -1 (0.001%) 92AO - 10ha (0.011%).

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Shrub habitats of Community importance are also representative, covering a relative surface of 35.6% (1780.8 ha).

A significant proportion of the habitat associations are endemic in Dobrogea (Sanda, Arcus, 1999 ; Dihoru, Donita,1970) - associations from Pimpinello-Thymion zygioidi, Asparago verticillati - Paliurion alliances, respectively Carpino-Tilienion tomentosae sub-alliances. For these endemic associations and for some habitats types/subtypes in which they fall under, the site brings together most of the distribution area, nationwide and worldwide (habitat sub-type 417,683 of habitat 91M0; subtype 34.9211 of habitat 62C0*; subtype 41.73724 of habitat 91AA). Habitat subtypes are coded according to the PHYSIS database.

For some types and/or habitat subtypes (62C0*, including sub-type 34.9213 ; 91YO- sub-type 41.C22 ; 91AA - sub-type 41.73723 ; 91MO - sub-type 41.76813), the site meets the highest proportion of the distribution area nationwide. This aspect also valid, in all probabilities, for sub-type 31.8B711 Ponto-Sarmatian dwarf almond scrub of habitat 40C0 *, identified on the Black Hill on the most extended area from Dobrogea.

Vulnerability:

The biggest threats in terms of the species and habitats of the site are represented, in a descending order:

- Hunting, more than half of the surface of the site is included in hunting funds.
- The decreased of forest biodiversity by derivation (due to competition between Quercus and mixed species) favored by the management
- Prospects for extending careers and wind farms
- Planting steppe habitats
- Construction and amenities outside built areas of cities

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3.2. ROSPA0091 Babadag Forest

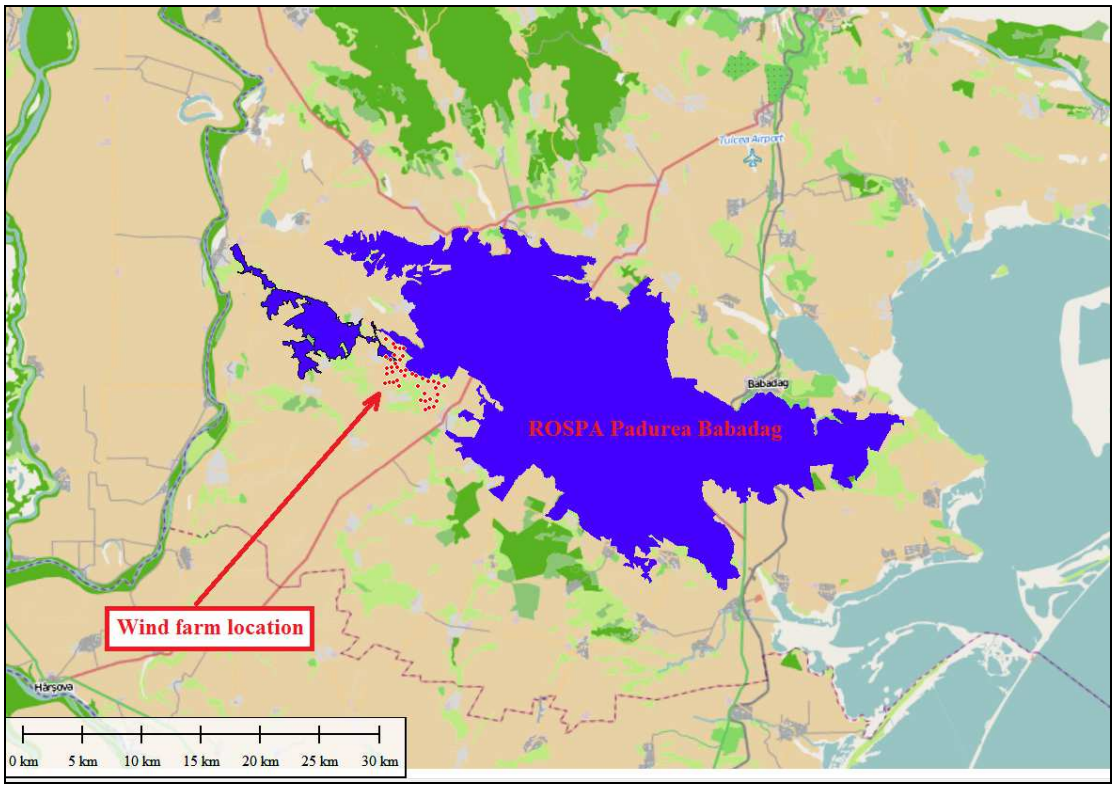

Figure 18. map source: openstreetmap

Relations with other described sites Natura 2000: ROSCI0201 North Dobrogea Plateau
Region – Dobrogea
County- Tulcea
Biogeographic region- Steppe
Site-center location - N 44° 52’ 51”; E 28° 30’ 21”
Altitude (m): min. 0; max. 400; med. 191
Site Surface Area (ha): 58.473
Custodian: it is not attributed to a custodian
Management plan: is not elaborated yet

Ecological information

Table 6. Bird species listed in Ann.I of Council Directive 2009/147/EC

Codes	Species	Resident	Breed	Winter	Stage	Population	Conserv.	Isolation	Global
A090	*Aquila clanga*				2-5 i	B	B	C	B
A224	*Caprimulgus europaeus*		C			C	B	C	C
A231	*Coracias garrulus*		400-500 p			B	B	C	B
A238	*Dendrocopos medius*	500-620 p				B	B	C	B
A236	*Dryocopus martius*	60-80 p				C	B	C	C
A103	*Falco peregrinus*				2-4 i	D			
A320	*Ficedula parva*				500-2500 i	D			
A338	*Lanius collurio*		C			C	B	C	C
A339	*Lanius minor*		C			C	C	C	B
A246	*Lullula arborea*		RC			D			
A234	*Picus canus*	200-300 p				C	B	C	C
A402	*Accipiter brevipes*		60-100p			A	A	C	A

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A215	*Bubo bubo*		1-4p			C	B	C	B
A403	*Buteo rufinus*		15-30p			B	B	C	B
A083	*Circus macrourus*				70-100i	B	B	C	B
A075	*Haliaeetus albicilla*		1-1p		5-10i	C	B	C	C
A242	*Melanocorypha calandra*		800-1500 p			C	B	C	B
A397	*Tadorna ferruginea*		3-7 p		<243 i	B	B	C	B
A133	*Burhinus oedicnemus*		35-50 p		400-500 i	B	B	C	B
A097	*Falco vespertinus*				600-800i	C	B	C	B
A307	*Sylvia nisoria*		300-400p			C	A	C	B
A511	*Falco cherrug*		1-2p		6-8i	B	B	B	B
A255	*Anthus campestris*		1600-2000p			C	B	C	B
A379	*Emberiza hortulana*		600-800 p			C	A	C	B
A404	*Aquila heliaca*				3-5i	B	B	C	C
A072	*Pernis apivorus*				3190-7050 i	C	B	C	B
A080	*Circaetus gallicus*		20-30p		195-300i	B	B	C	B
A081	*Circus aeruginosus*				1517-3970 i	C	B	C	C
A082	*Circus cyaneus*			20-30i	110-330i	C	B	C	B
A084	*Circus pygargus*		0-3 p		500-830 i	B	B	C	B
A089	*Aquila pomarina*		15-30 p		4270-8580 i	C	B	C	B
A092	*Hieraaetus pennatus*		20-30p		270-400i	A	B	C	B
A019	*Pelecanus onocrotalus*				2850-3800 i	C	B	B	B
A030	*Ciconia nigra*				1877-2123 i	B	B	C	B
A243	*Calandrella brachydactyla*		200-300p			B	B	C	C
A031	*Ciconia ciconia*				35000-122000i	B	B	C	B

LEGEND				
STATUS	**POPULATION**	**IZOLATION**	**CONSERVATION**	**GLOBAL**
F - frequent	A - 100 p > 15%	A – population (almost) isolated	A - excellent conservation	A - excellent value
R - rare	B - 15 p > 2%	B – population not isolated, but on margins of area of distribution	B - good conservation	B - good value
RC - relatively common	C - 2 p > 0%	C – population not isolated within extended distribution range	C - average or reduced conservation	C - significant value
P - present	D – insignificant population			
C - common				
A - abundant				
i - individuals				
p - pairs				
POPULATION: Size and density of the population of the species present on the site in relation to the populations present within national territory. This criterion exists to evaluate the relative size or density of the population in the site with that of the national population.				
CONSERVATION: Degree of conservation of the features of the habitat which are important for the species concerned. And possibilities for restoration. **A.** conservation excellent= elements in an excellent condition, independent of the grading of the possibility of restoration; **B**. Good conservation= elements well conserved independent of the possibility of restoration,= elements in average or partially degraded condition and restoration easy; **C**: average or reduced conservation = all other combinations				
ISOLATION: Degree of isolation of the population present on the site in relation to the natural range of the species.				
GLOBAL: Global assessment of the value of the site for conservation of the species concerned.				

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Table 7. Regularly occurring Migratory Birds not listed on Annex I of Council Directive 2009/147/EC

Codes	Species	Resident	Breed	Winter	Stage	Population	Conserv.	Isolation	Global
A435	*Oenanthe isabellina*		20-30 p			A	B	C	B
A088	*Buteo lagopus*			R		D			
A363	*Carduelis chloris*		RC			D			
A208	*Columba palumbus*		C			D			
A212	*Cuculus canorus*		C			D			
A299	*Hippolais icterina*		RC			D			
A251	*Hirundo rustica*		P		C	D			
A340	*Lanius excubitor*			R		D			
A341	*Lanius senator*		P			D			
A262	*Motacilla alba*		C			D			
A260	*Motacilla flava*		RC			D			
A319	*Muscicapa striata*		RC			D			
A277	*Oenanthe oenanthe*		C			D			
A337	*Oriolus oriolus*		C			D			
A443	*Parus lugubris*	700-800 p				B	B	C	B
A274	*Phoenicurus phoenicurus*		RC			D			
A315	*Phylloscopus collybita*		C		C	D			
A314	*Phylloscopus sibilatrix*		RC			D			
A276	*Saxicola torquata*		RC			D			
A210	*Streptopelia turtur*		C			D			
A351	*Sturnus vulgaris*		C		C	D			
A311	*Sylvia atricapilla*		RC			D			
A308	*Sylvia curruca*		RC			D			
A232	*Upupa epops*		C			D			
A086	*Accipiter nisus*				2503-3970 i	C	B	C	B
A087	*Buteo buteo*				14675-28487 i	C	B	C	C

LEGEND				
STATUS	**POPULATION**	**IZOLATION**	**CONSERVATION**	**GLOBAL**
F - frequent	A - 100 p > 15%	A – population (almost) isolated	A - excellent conservation	A - excellent value
R - rare	B - 15 p > 2%	B – population not isolated, but on margins of area of distribution	B - good conservation	B - good value
RC - relatively common	C - 2 p > 0%	C – population not isolated within extended distribution range	C - average or reduced conservation	C - significant value
P - present	D – insignificant population			
C - common				
A - abundant				
i - individuals				
p - pairs				
POPULATION: Size and density of the population of the species present on the site in relation to the populations present within national territory. This criterion exists to evaluate the relative size or density of the population in the site with that of the national population.				
CONSERVATION: Degree of conservation of the features of the habitat which are important for the species concerned. And possibilities for restoration. **A.** conservation excellent= elements in an excellent condition, independent of the grading of the possibility of restoration; **B**. Good conservation= elements well conserved independent of the possibility of restoration,= elements in average or partially degraded condition and restoration easy; **C**: average or reduced conservation = all other combinations				
ISOLATION: Degree of isolation of the population present on the site in relation to the natural range of the species.				
GLOBAL: Global assessment of the value of the site for conservation of the species concerned.				

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Site description

General site characteristics

Cod	%	CLC	Habitat classes
N09	4	321	Natural grasslands, steppes
N12	16	211-213	Agricultural areas (arable land)
N14	5	231	Pastures
N16	66	311	Broad-leaved forests
N23	2	1xx	Other artificial surfaces (localities, mine etc.)
N26	7	324	Forests habitats (transitional woodland shrub)

Quality and importance:

This site houses important effectives of protected bird species. According to data, there are the following categories:

a) number of species from Annex 1 of the Birds Directive: 38

b) number of other migratory species, listed in the Annexes of the Convention on Migratory Species (Bonn): 61

c) number of globally threatened species: 6

The site is important for the breeding population of the following species:

Falco vespertinus
Falco cherrug
Coracias garrulus
Hieraaetus pennatus
Accipiter brevipes
Circaetus gallicus
Circus pygargus
Oenanthe pleschanka
Picus canus
Milvus migrans
Dendrocopos medius

The site is important during the migration period for the following species

Haliaeetus albicilla
Ficedula parva
Ciconia ciconia

The site is important during the wintering period for the following species

Circus macrourus
Circus cyaneus

Vulnerability

The expansion of agricultural land and household dependencies, the construction of new tourist attractions, intensive grazing, poaching. Babadag Forest is crossed by three main roads: national road 22D, national road 22A and national road 22 (E87).

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4. DESIGN OF FIELD SURVEY

This study is based on field observations carried out during January of 2012 – June of 2013 and on the information included in the Natura 2000 Standard Forms of the sites of Community interest within the area analyzed, but also on the reports and studies published over time for this area. For the analysis of the impact on the avifauna and chiropterofauna from the area analyzed, the results obtained during the monitoring conducted between 2006 and 2011 on the site of the Dorobantu-Topolog wind farm were taken into account.

Observations focused on the main biodiversity elements from the area of Dorobantu-Topolog wind farm. Special attention was given to bird species that use the area studied for foraging, shelter, nesting or passage, and to bat species that can reach the site of the wind farm.

There were 2 stages in establishing the boundaries of the area studied, according to the implementation phases of the project: 'Dorobantu-Topolog Wind Farm'.

In **Stage 1** (2006 - 2012) corresponding to **the phase of obtaining the regulatory documents, in accordance to the national legislation (Environmental Permit, Environmental Accord)** - the configuration of all the wind farms from the proximity of the objective analyzed was taken into consideration. Therefore, the studied area included:

- the site of the Dorobantu-Topolog wind farm;
- the sites of the wind farms in proximity to the wind farm analyzed;
- the land areas in the immediate vicinity of the four wind farms having habitats similar to those found within the site of the Dorobantu-Topolog wind farm.

A further reason for the establishing the boundaries of the initial area as illustrated in figure 19, was the fact that, of the 57 wind turbines belonging to the four wind farms proposed to be built in the area, 23 turbines were included in the North Dobrogea Plateau SCI (*ROSCI0201*), and only one was included in Babadag Forest SPA (*ROSPA0091*).

Over the period of 2006 – 2012, our team of experts also conducted observations in the forest area from the wind farm (up to 500 m from the turbine locations, towards the interior of the forest) with the purpose of identifying nests of raptor species.

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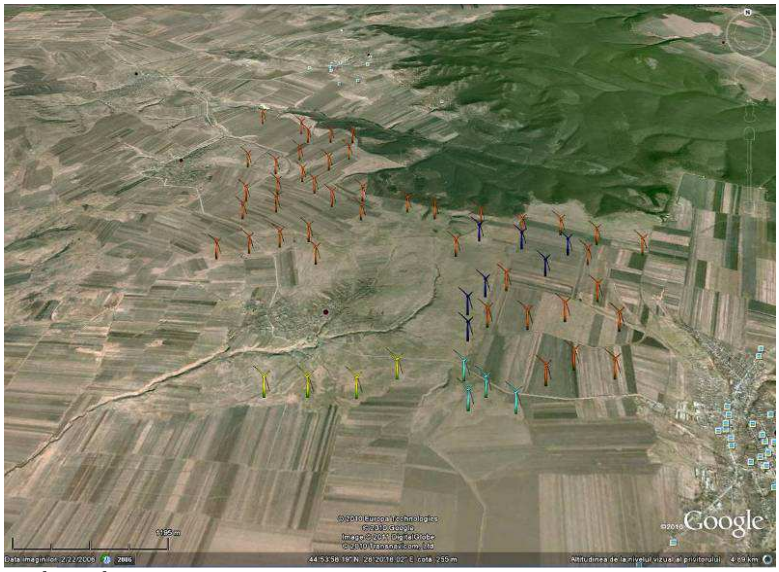

Note: the turbines are not inserted to scale

	S.C. LANDPOWER S.R.L. – "Construction of Dorobantu-Topolog Wind Farm", Dorobantu, Topolog, Casimcea Township
	S.C. ECOPROD ENERGY S.R.L. - "Development of Wind Farm" –Topolog 2, Topolog Township
	S.C. TOTAL ELECTRIC S.R.L. - "Development of Wind Farm" –Topolog 3, Topolog Township
	S.C. SEHER EOL S.R.L - "Construction of wind farm, roads and electrical networks" –Topolog Township

Figure 19. The area studied for monitoring – Stage 1

In **Stage 2** (March-June 2013) when elaborating *Report regarding the monitoring of the fauna and chiropterofauna on the location and in the vicinity of the wind farm Dorobantu-Topolog*, the monitoring area has been established in compliance with the recommendations of the SNH (Scottish Natural Heritage) guide. Therefore, the studied area was extended up to 2 km inside the forest area (as opposed to 500 m in Stage 1), and for identifying potential shelter areas for bats, routes over distances up to 7.2 km from the wind farm analyzed were covered.

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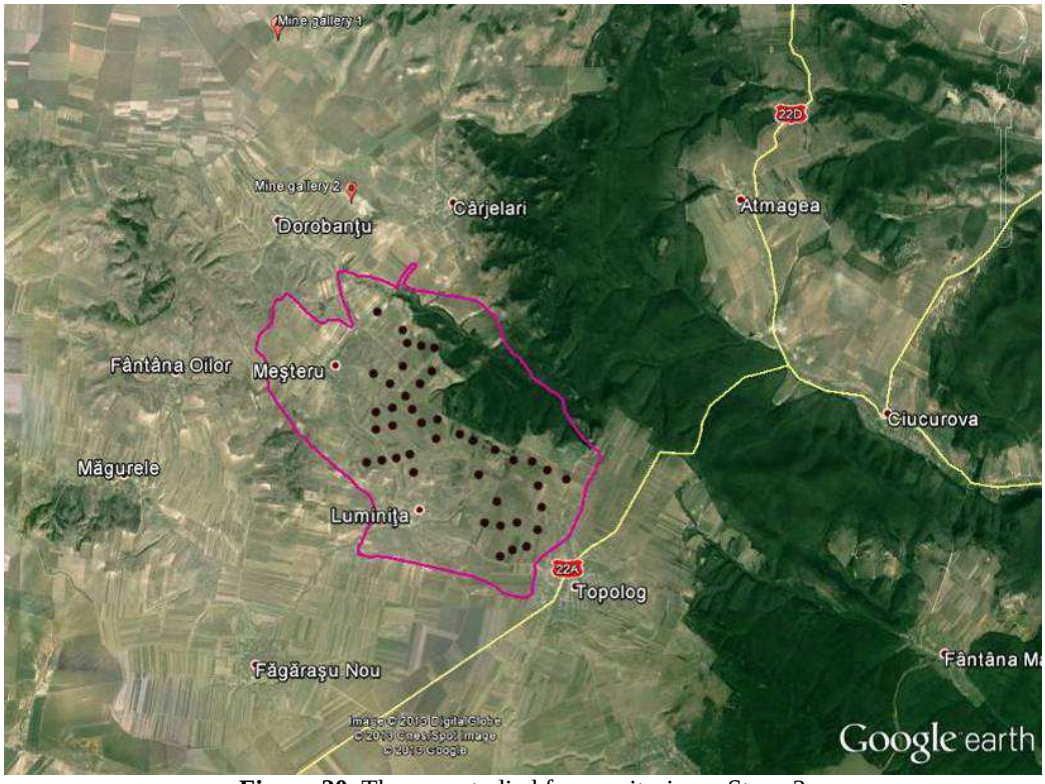

Figure 20. The area studied for monitoring – Stage 2

4.1. Birds

4.1.1. Definition of target species

As target bird species have been considered, since the beginning of monitoring of biodiversity in the studied area, those species protected at international, European and national level, which are susceptible to be subject to the impact of wind farms.

Therefore, the target species were selected by taking into account: the standard form of the of Special Avifaunistic Protection Area Babadag Forest (ROSPA 0091 Babadag Forest), the species of national interest that require strict protection, and migratory species that may cross or reach the area of the wind farm, following the Pontic migration route (Pontica flyroute).

We emphasize that only protected species or conservative interest species were taken into consideration, in compliance with the SNH guide recommendations.

The target bird species identified within the study are the following (table 8):

Table 8. Target species

Target Species	
Accipiter brevipes (Levant Sparrowhawk)	*Aegithalos caudatus (Long-tailed Tit)*
Accipiter gentilis (Northern Goshawk)	*Athene noctua (Little Owl)*
Accipiter nisus (Sparrowhawk)	*Carduelis cannabina (Linnet)*
Anthus campestris (Tawny Pipit)	*Carduelis carduelis (Goldfinch)*
Aquila heliaca (Imperial Eagle)	*Carduelis chloris (Greenfinch)*

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Aquila pomarina (Lesser Spotted Eagle)	*Carduelis flammea (Redpoll)*
Asio flammeus (Short-eared Owl)	*Carduelis spinus (Siskin)*
Burhinus oedicnemus (Stone Curlew)	*Coccothraustes coccothraustes (Hawfinch)*
Buteo buteo (Common Buzzard)	*Coracias garrulous (Roller)*
Buteo lagopus (Rough-legged Buzzard)	*Corvus corax (Raven)*
Buteo rufinus (Long-legged Buzzard)	*Dendrocopos medius (Middle Spotted Woodpecker)*
Calandrella brachydactyla (Short-toed Lark)	*Dryocopus martius (Black Woodpecker)*
Ciconia ciconia (White Stork)	*Erithacus rubecula (Robin)*
Ciconia nigra (Black Stork)	*Falco cherrug (Saker Falcon)*
Circaetus gallicus (Short-toed Eagle)	*Falco peregrines (Peregrine Falcon)*
Circus aeruginosus (Marsh Harrier)	*Falco subbuteo (Hobby)*
Circus cyaneus (Hen Harrier)	*Ficedula parva (Red-breasted Flycatcher)*
Circus macrourus (Pallid Harrier)	*Jynx torquilla (Wryneck)*
Circus pygargus (Montagu's Harrier)	*Lullula arborea (Woodlark)*
Emberiza hortulana (Ortolan Bunting)	*Motacilla alba (White/Pied Wagtail)*
Falco tinnunculus (Kestrel)	*Motacilla flava (Yellow Wagtail)*
Falco vespertinus (Red-footed Falcon)	*Muscicapa striata (Spotted Flycatcher)*
Haliaeetus albicilla (White-tailed Eagle)	*Oriolus oriolus (Golden Oriole)*
Hieraaetus pennatus (Booted Eagle)	*Otus scops (Scops Owl)*
Lanius collurio (Red-backed Shrike)	*Panurus biarmicus (Bearded Reedling)*
Lanius minor (Lesser Grey Shrike)	*Passer hispaniolensis (Spanish Sparrow)*
Melanocorypha calandra (Calandra Lark)	*Phoenicurus ochruros (Black Redstart)*
Merops apiaster (Bee-eater)	*Phoenicurus phoenicurus (Redstart)*
Miliaria calandra (Corn-Bunting)	*Phylloscopus collybita (Chiffchaff)*
Milvus migrans (Black Kite)	*Phylloscopus sibilatrix (Wood Warbler)*
Oenanthe pleschanka (Pied Wheatear)	*Picus canus (Grey-headed Woodpecker)*
Pandion haliaetus (Osprey)	*Picus viridis (Green Woodpecker)*
Pelecanus crispus (Dalmatian Pelican)	*Sitta europaea (Nuthatch)*
Pelecanus onocrotalus (White Pelican)	*Strix aluco (Tawny Owl)*
Pernis apivorus (Honey Buzzard)	*Sturnus roseus (Rose-coloured Starling)*
Tadorna ferruginea (Ruddy Shelduck)	*Sylvia nisoria (Barred Warbler)*
Tyto alba (Barn Owl)	*Upupa epops (Hoopoe)*

4.1.1.1. Species included in the lists of the Natura 2000 sites

In compliance with the standard form of ROSPA 0091 Babadag Forest, the following species of interest can be listed in the impact evaluation (also mentioned in Annex I of the Birds Directive 2009/147/EC):

Table 9. The importance of the site

Site important for		
Breeding species	**Migrants species**	**Wintering species**
Accipiter brevipes	*Ciconia ciconia*	*Circus cyaneus (also migrant/passage)*
Circaetus gallicus (also migrant/passage)	*Ficedula parva*	*Circus macrourus (also migrant/passage)*

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Circus pygargus (also migrant/passage)	*Haliaeetus albicilla (also breeding)*	
Coracias garrulous		
Dendrocopos medius (also resident)		
Falco cherrug (also migrant/passage)		
Falco vespertinus (also migrant/passage)		
Hieraaetus pennatus (also migrant/passage)		
Milvus migrans		
Oenanthe pleschanka		
Picus canus (also resident)		

Table 10. Other SPA Babadag Forest birds species

(Annex I Birds Directive)				
	Resident	**Breeding**	**Wintering**	**Passage**
Anthus campestris		x		
Aquila clanga				x
Aquila heliacal				x
Aquila pomarina		x		x
Bubo bubo		x		
Burhinus oedicnemus		x		x
Buteo rufinus		x		
Calandrella brachydactyla		x		
Caprimulgus europaeus		x		
Ciconia nigra				x
Circus aeruginosus				x
Dryocopus martius	x			
Emberiza hortulana		x		
Falco peregrines				x
Lanius collurio		x		
Lanius minor		x		
Lullula arborea		x		
Melanocorypha calandra		x		
Pelecanus onocrotalus				x
Pernis apivorus				x
Sylvia nisoria		x		
Tadorna ferruginea		x		x

4.1.1.2 Species of concern at national level

Nationwide, a regime of strict protection was established for a number of bird species, by Government Emergency Ordinance no. 57/2007 on the regime of protected natural areas, conservation of natural habitats, wild flora and fauna, approved with amendments and

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completions by Law no. 49/2011. These species are listed in Annex 4B – SPECIES OF NATURAL INTEREST.

Animal and plant species requiring strict protection.

Therefore, in Annex 4B of the G.D. 57/2007 a total of 67 bird species are listed, requiring strict protection nationwide. Of these, 9 are listed in the standard form of the Babadag Forest ROSPA 0091 and 22 may be considered, based on the geographical distribution and habitat characteristics of Babadag Forest ROSPA, as potentially presented within this site.

Table 11. List of species enlisted in the Annex 4B of the GUO 57/2007 and presence (potential or enlisted) of these species in ROSPA0091 Babadag Forest

Species GUO 57/2007 Ann. 4 B	**ROSPA0091**			
	Resident	Passage	Wintering	Breeding
Actitis hypoleucos				
Aegithalos caudatus				x
Anthropoides virgo				
Arenaria interpres				
Athene noctua	x			x
Bombycilla garrulus				
Carduelis cannabina	x			x
Carduelis carduelis	x			x
Carduelis chloris	x			x
Carduelis flammea			x	
Carduelis flavirostris				
Carduelis hornemanni				
Carduelis spinus			x	
Carpodacus erythrinus				
Cettia cetti				
Cinclus cinclus				
Coccothraustes coccothraustes	x			
Corvus corax				x
Emberiza cia				
Emberiza melanocephala				
Eremophila alpestris				
Erithacus rubecula	x			x
Falco subbuteo				x
Falco tinnunculus	x			x
Grus grus				
Jynx torquilla	x			x
Limicola falcinellus				
Locustella naevia				
Merops apiaster				x
Miliaria calandra	x			x
Monticola saxatilis				
Motacilla alba				x

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Motacilla cinerea				
Motacilla citreola				
Motacilla flava				x
Muscicapa striata				x
Nucifraga caryocatactes				
Oriolus oriolus				x
Otus scops		x		x
Panurus biarmicus		x		
Passer hispaniolensis				x
Phoenicurus ochruros				x
Phoenicurus phoenicurus				x
Phylloscopus bonelli				
Phylloscopus collybita		x		x
Phylloscopus proregulus				
Phylloscopus schwarzi				
Phylloscopus sibilatrix				x
Phylloscopus trochiloides				
Phylloscopus trochilus				
Picus viridis	x			x
Prunella collaris				
Prunella modularis				
Regulus ignicapillus				
Regulus regulus				
Remiz pendulinus				
Serinus serinus				
Sitta europaea	x			x
Stercorarius longicaudus				
Stercorarius parasiticus				
Stercorarius pomarinus				
Stercorarius skua				
Sturnus roseus				x
Tachybaptus ruficollis				
Tichodroma muraria				
Tyto alba	x			x
Upupa epops				x

Legend	
x	already in SPA
x	potentially in SPA

4.1.1.3. Migratory species of concern

Within this sub-chapter, the migrant bird species considered to be threatened at a global level, according to Convention on conservation of migratory species of wild animals (Bonn

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Convention, 1979), adopted in Romania through Law no. 13/1998 on the Conservation of Migratory Species of Wild Animals.

Of the 11 bird species from Annex I of the Law no. 13/1998, which contains the lists of **Endangered migratory species**, 3 species potentially present on the Pontica flyroute were highlighted in the study, based on geographical distribution.

Table 12. bird species from Annex I of the Law no. 13/1998

Species Act no.13/1998 that occur in Romania	**Potentially present on Pontica flyroute**
Pelecanus crispus	*
Pelecanus onocrotalus	*
Geronticus eremite	
Oxyura leucocephala	
Haliaeetus albicilla	*
Grus leucogeranus	
Otis tarda	
Numenius borealis	
Numenius tenuirostris	
Larus audouinii	
Larus leucophthalmus	

Regarding the Pontic flyroute, apart from the information present in the bibliographic studies already mentioned in the Appropriate Assessment, the elaborator took into account the following information on migration routes for its graphical representation:

In Romania birds migrate on a broad front, and yet hundreds, or even thousands of specimens gather on well established routes. The Carpathians are a natural barrier and influence the direction of the migration, as well as the Black Sea, whose shoreline is used by predators who come from Northern Europe or Western Asia. Macin Mountains are located on the Via Pontica migration route and represent the only place in the country, so far, where over 30.000 migrating bird specimens with a gliding flight can be observed yearly, out of which over 10.000 raptors, and the rest white storks. The number of species of predatory birds that can be observed during their migration is higher than anywhere in Europe, with 29 species of raptors.

The hills from the foot of the mountains offer favorable conditions for the formation of thermal convection on sunny days, and the steep peaks of Pricopanului deflects the wind (especially the wind from the NE and NW), creating vertical currents that birds use to maintain flight altitude.

According to available, generally accepted bibliographic sources at the moment, namely: "Migration of Birds" - Rudescu L. Scientific Publishing Bucharest, "The dynamics and migration

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of birds" - Ciochia V., Scientific and Encyclopedic Publishing House, the Babadag Plateau area is a confluence of most of the migration routes (except the Sarmatian) (cnf. V. Ciochia 1984).

In analyzing the potential impact of the project on migration routes, it must be kept in mind that the images from these bibliographical studies are only indicative, having a customized character depending on the author, and the graphical representation is done on a large scale, without sufficient spatial details.

A strictly localized in space approach of the migration routes, from the elaborator's standpoint, does not present a high degree of accuracy, as revealed in the paper "Bird Migration" Rudescu L., 1958: "*The description of passage roads should not be considered rigid and formal. There is here, as in general the issue of bird migration, a number of exceptions, caused by two main phenomena*:

- *The hydrographic regime of the Danube River;*
- *The climatic situation of the year in question.* "

"Establishing the exact migration routes is very difficult, because almost every species has its own path."

4.1.1.4. Additional information

Table 13. the species that are both enlisted in Standard Forms NATURA 2000 of the ROSPA0091 and classified as *particularly vulnerable to wind farms* in Annex II to the *EU Guidance on wind energy development in accordance with the EU nature legislation*

Species both enlisted SPA Babadag Forest and EU Guidance	Habitat displacement	Birds strike/ collision	Barrier effect
Accipiter nisus			
Aquila heliacal			
Aquila pomarina			
Bubo bubo			
Buteo buteo			
Buteo lagopus			
Caprimulgus europaeus			
Ciconia ciconia			
Ciconia nigra			
Circaetus gallicus			
Circus aeruginosus			
Circus cyaneus			
Circus pygargus			
Columba palumbus			
Cuculus canorus			
Falco peregrines			
Haliaeetus albicilla			
Milvus migrans			
Oenanthe oenanthe			

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Pernis apivorus			
Streptopelia turtur			
Sturnus vulgaris			
Upupa epops			

Legend	
	evidence of a substantial risk of impact
	evidence or indication of risk or impact
	potential risk or impact
	small or non-significant risk or impact but still to be considered in assessment

4.1.2. Definition of survey method

For the area afferent to the Dorobantu - Topolog wind farm, field observations were made, over the course of 7 years. Foreseeing the implementation of wind farms in the areas of Topolog Casimcea and Dorobantu communes, our team of specialists conducted field observations since 2006 - before establishing the legal framework at a national level for Natura 2000 European Ecological Network.

The monitoring methods have evolved over time, being constantly improved and updated in response to new data obtained in the field.

Simultaneously with changes to the methodology, and for the need to cover new methodological requirements, the team of specialists was extended and technical equipment were diversified, in order to optimize the specific field research activities.

The whole process of monitoring the biodiversity from the area of the analyzed wind farm, as well as subsequent changes in methodology are in accordance to Point 3.6 of the Scottish Guideline *"The assessment process should retain the flexibility to be able to respond to new information, as 'unforeseen' findings may arise, including extending the field survey to ensure there is sufficient information, or in some cases truncating it where there is adequate evidence that target species are so rarely present that a significant impact is unlikely. Inappropriate or inadequate effort in observation of ornithological interests has often arisen because of the difficulties in redesigning surveys to respond to new information."*

4.1.2.1. Survey methods: Period 2006-2012

The monitoring of bird species was made by using the transect method, combined with the fixed point method and the method of the favorable point (vantage point method).

The ''land use'' method was also applied, that involves recording the habitat types from km to km along a transect. In order to analyze the species-habitat relationship, this method was correlated with data collected by using the transects method.

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Additional to the transects performed on the site of wind farm, transects were also performed the 500 m inside of the Babadag Forest area, in order to identify some potential nests or birds of prey.

After each field visits, monitoring sheets were prepared which stood at the basis of data centralizers- essential for the statistical analysis of the obtained data.

a) Transects method combined with fixed point method

The monitoring of nesting and wintering bird species in the studied area is performed by this method.

The number of transects is established according to: number of turbines and the total area occupied by them, area particularities (topography, vegetation etc.), so that transects across the entire studied area capture the specific habitats of the area, in order to analyze the habitat-species relationship.

The fixed points are established along a transect from 3 to 3 km. During the transect, the following are written down:

- observed bird species;
- number of individuals for each species;
- species activities;
- habitat type where the species was observed.

In each fixed point, observations are made for about 5 minute and the following are noted:

- the fixed point from where the observation is made;
- observed bird species;
- number of individuals of each species;
- species activity type;
- type of habitat were the species were observed.

By using the fixed point method, data are obtained regarding:

- bird species diversity during breeding and wintering period (specific composition/qualitative evaluation);
- analysis of species-habitat relationship;
- flight height of the species.

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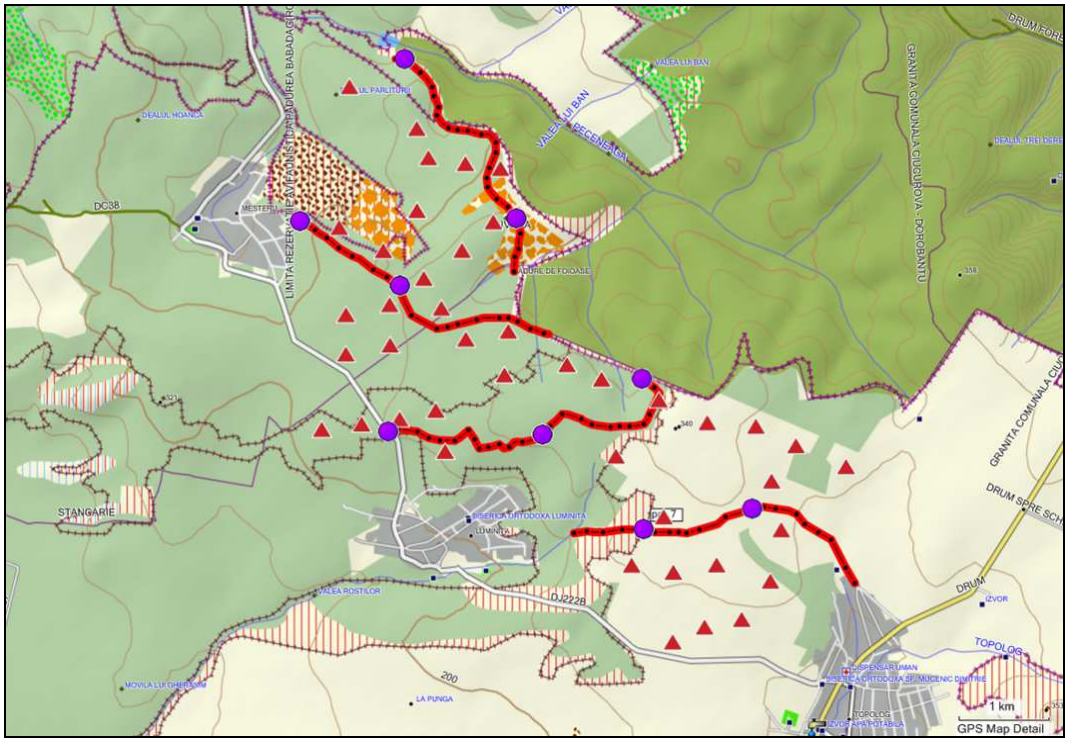

Figure 21. Transects and fixed points for birds (2006-2012)

LEGEND: **Birds transects** **Fixed points for birds observations**

b) The method of the Vantage Point

This method is applied to evaluate the collision risk of the bird species of conservative interest. Observations from the favorable points (Vantage point survey) involve performing of observations from a fixed point located in a favorable position, which allows observation of the bird's flight activity, without the presence of observer affecting its behavior.

The longer the observation period from a fixed point is, the better known will the flight behavior pattern of the species be, and the impact assessment will be made with a higher accuracy.

The purpose of the observations from a favorable point is to:

1. Collect data on target bird species regarding:

- the time spent in flight over the studied area;
- relative usage (food, nuptial parade, resting, passage) of different parts of the studied area;
- percentage of time spent in flight above or below the turbine rotor (rotor diameter)- it applies after the implementation of the wind farm;

2. to calculate the index of flight activity for other species than the target ones– *secondary species*

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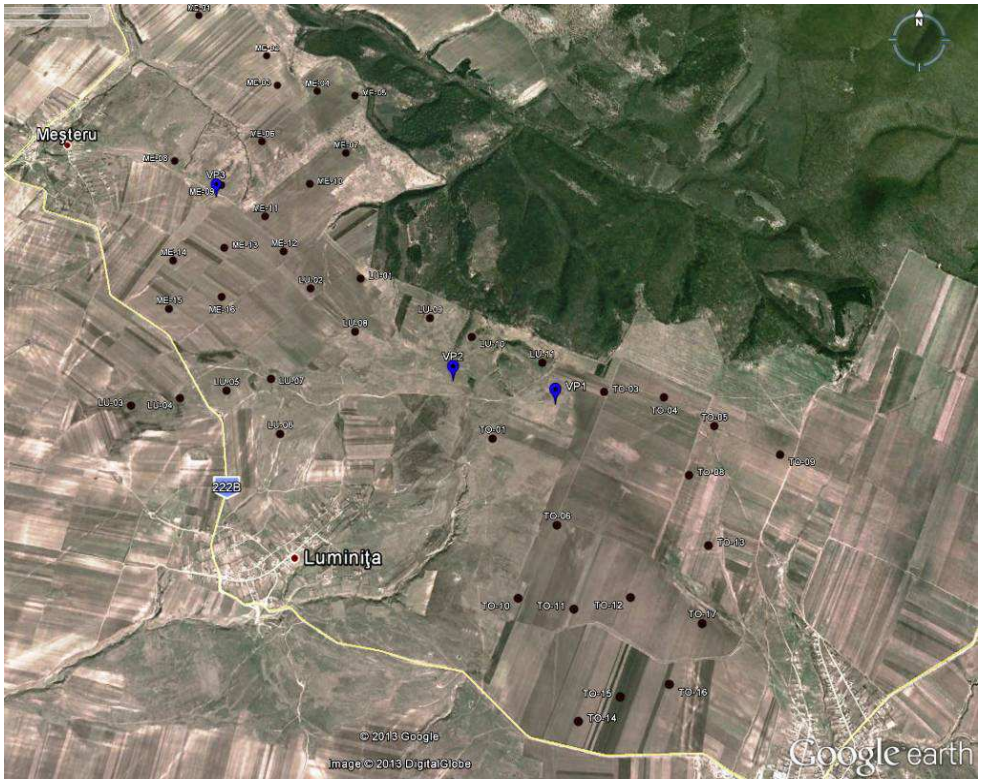

Figure 22. Vantage Points used for avifauna monitoring (2006-2013)

Vantage Points coordinates in WGS 84 system:

Observations points	Latitude	Longitude
Vantage Point 1	44 54.294	28 21.322
Vantage Point 2	44 54.400	28 20.727
Vantage Point 3	44 55.302	28 19.238

Methodology description

Data regarding the flight activity of birds was collected during the observations made from strategically selected vantage points (VP). It was also intended for each observation point offer a higher visibility, an arc of at least 180 degrees.

Throughout the study, the same points are used. During observations made from the points, we tried as much as possible to minimize the effect of the observer on birds' behavior, so as to keep both a good visibility of the monitored area, and at the same time, not to disturb the birds due to the human presence.

In order to obtain relevant flying activity data, the bird must be followed up for a representative period of time.

The period of time granted to monitoring the birds flight activity in the analyzed area, was 2 to 3 hours for most birds species in each point (2 points) for the breeding period and 3-6 hours (3 points) during the spring and autumn migration.

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Observations were made during the day from sunrise to dusk by at least two observers, in maximum visibility conditions.

Field experiences show that the observer's acuity decreases after 3 hours, or even after a shorter period, which is why we preferred to form teams of at least two observers.

We opted for the disperse observation periods throughout the day, so as to capture all the aspects and particularities of the birds flight behavior.

During the nesting season, the behavioral manifestations that may indicate nesting in the area (nuptial parade, territorial flight) were especially pursued, as well as the flight behavior of the juveniles, as they are vulnerable to collision with wind turbines due to lack of flight experience, and also because juveniles don't have sufficiently well formed plumage when they begin to fly.

During the spring migration, observations were made in conditions of poor visibility (fog, overcast sky), to see if in such conditions, the activity of some key birds species continues or not. This is especially important for birds that soar, when it is possible for the wind direction and speed to strongly influence the behavior.

4.1.2.2. Survey methods: Period 2013

Migratory birds

For the monitoring of the species of migratory birds, the Vantage Point method it was used (same as for the previous period 2006-2012). Therefore, observations were performed from three locations, chosen so as to ensure a maximum visibility over the entire surface of interest VP 1 - N44 54.294 E28 21.322, VP 2 - N44 54.400, E28 20.727, VP 3 - N44 55.302 E28 19.238.

The monitoring was performed over a period of 8 hours, during the migration period of the birds and with a frequency of an observation stage/week.

For each observation, the following were registered: the species, the distance towards the observer, the flight direction and the approximate height the bird was flying at. The identifications were performed directly on site, using specialty devices, or subsequently, using the pictures taken during the monitoring activity. For the observed species, pictures were taken, within the limit of the possibilities, which allow a subsequent verification of the identifications performed on site. The data was registered on special sheets. Data related to the meteorological conditions registered at the location was also registered on the sheets. The data on the sheets was centralized in a data base, in an electronic format, and was subsequently processed using statistical methods.

- binoculars: BAIGISH; NIKON; BUSHNELL; MIL-TEC; EAGLE OPTICS RANGER.

- spotting scope: CELESTRON Ultima 80; Baighis 32 M (infrared)

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- **still cameras:** NIKON D7000 lens 70-300mm VR II, NIKON D80 lens 70-300 mm VR II, NIKON D3000 lens 70-300 mm VR II; NIKON Coolpix L120 ; CANON Easy Share SX-30; CANON EOS 550 D lens 18-270 mm;
- **GPS:** GARMIN 60CSx; GARMIN 62S;
- **portable meteorological station**: SKYWATCH ATMOS.

Nesting birds

For the monitoring of the avifauna the method of the observations on transects was used.

The observations were carried out in April and May, during the nesting season, in order to be able to better observe the aspects related to the nesting birds. Five transects were chosen, which cover the entire monitoring surface:

- Transect 1. Located on the NE border of the area for the implementation of the project, at the interior limit of ROSCI North Dobrogea Plateau and ROSPA Babadag Forest, on a distance of about 3 km. The observations were performed from South to North.
- Transect 2. Located between Mesteru Locality at West and the South limit of the woody area at East, on a distance of about 3 km. The observations were performed from West to East.
- Transect 3. Located in the central area of the site where the wind farm will be located, between its West extremity and the South limit of the woody area (inside ROSPA Babadag Forest). The distance on which the monitoring was performed – on a distance of about 4,7 km. The observations were performed from West to East.
- Transect 4. Located in the South area of the location where the wind farm will be located, between Luminita locality at West and Topolog locality at East, on a distance of about 3,2 km. The observations were performed from East to West.
- Transect 5. Located in the East area of the location where the wind farm will located, in the area of the grazing lands from the South of the woody area, on a distance of about 2 km. The observations were performed from West to East.

The transects were crossed by two persons endowed with observation equipment and still cameras. The observed birds were generally identified on site or subsequently, based on the pictures taken on site. For each observation, the following were registered: the species, the area were the bird was noticed – to the left, respectively to the right of the observer, on the movement direction and also the distance at which the observation was performed (and in this case there were used two categories – species noticed at 100 m from the transect and species noticed at over 100 m from the transect), the activity of the bird (flying, on the ground, eating, etc). The data regarding the meteorological conditions registered in the respective day were also written on the

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sheet. The observations were centralized in a data base, and the coordinates where the observations were performed were also written for the species.

Additional to the transects performed on the site of wind farm, 3 transects (A,B,C) were performed, in April, in the 2 km inside of Babadag Forest area, in order to identify some potential nests or birds of prey.

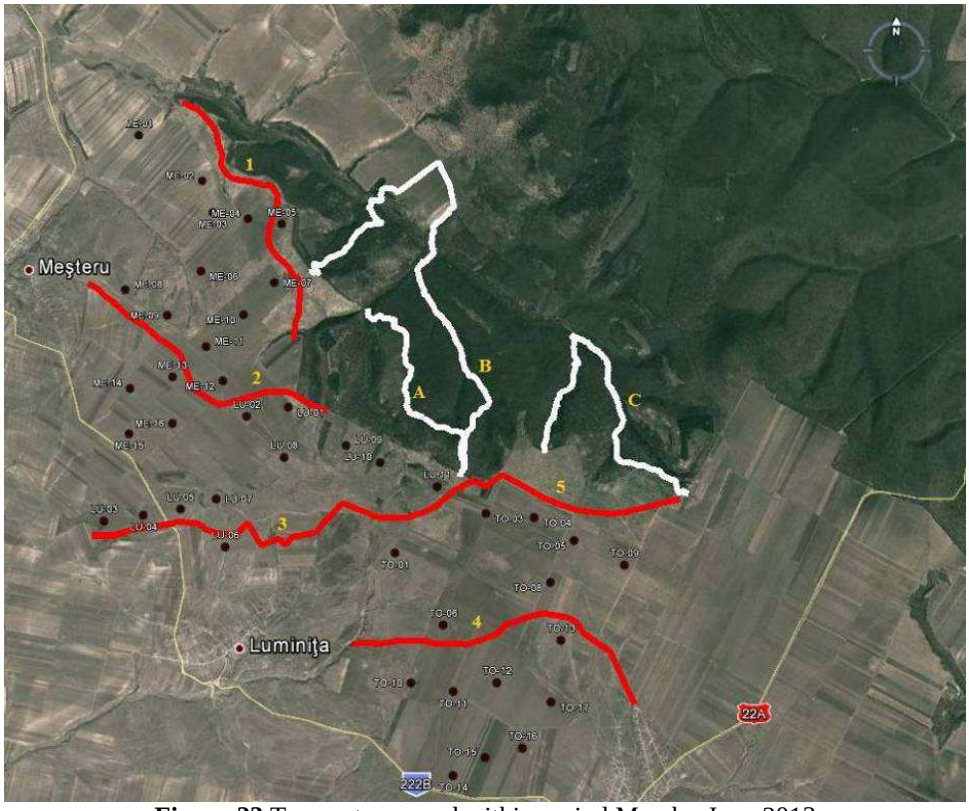

Figure 23. Transects crossed within period March - June 2013

The monitoring of the species of nocturnal birds was performed through observations with the help of an infrared camera (Pulsar Recon 750 R) and through the registration of their sounds with the help of a directional microphone (Yukon DSAS) connected to a Olympus VN-711 PC voice recorder.

A network of 25 points distributed across the studied area was used for monitoring; each point was visited twice each breeding season, around early April and late May. Surveys were undertaken within 500 m of the wind farm site area, as suggest by SNH guidance, and even more 500 m near the wooded area.

Observation points were selected within monitoring of nocturnal birds, coinciding with points of bio-acoustic monitoring of the bats.

It is important to note that the bird and bat monitoring methods used during spring 2013 will also be employed for the autumn 2013 monitoring, with the following modifications: the transect method for nesting species will no longer be employed, and additional field observations will be performed for identifying potential bat hibernation areas.

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4.1.2.3. Comments on the monitoring plan

Survey area

As we mentioned in Chapter 4. DESIGN OF FIELD SURVEY the studied area was changed with the elaboration of the *Report regarding the monitoring of the avifauna and chiropterofauna on the location and in the vicinity of the wind farm Dorobantu-Topolog,* from 2006 -2012. Therefore, the initial studied area was extended with up to 2 km into the forest area, in order to identify the nests of prey bird species.

In the Appropriate Assessment study for the objective *"BUILDING OF THE WIND FARM DOROBANTU-TOPOLOG outside the built-up area of communes Dorobantu, Topolog, Casimcea, Tulcea County, Romania"*, elaborated for the local environment protection authority, in Chapter B.2. (page 49)*'Data regarding the location, population and ecology of the species and/or habitats of Community interest present on the surface and in the immediate vicinity of the plan, which are mentioned in the standard forms of the protected natural area of Community interest*', it was pointed out that, in the case of the **bird species from the vicinity of the wind farm** mentioned in the Standard Form of Babadag Forest SPA, the team of specialists also conducted observations in the forest area, from the wind farm (up to 500 m from the turbine locations towards the inside of the forest), in order to identify species of raptor nests, but none was observed.

Therefore, extending the studied area with another 1500 m in 2013 allowed the identification within Babadag Forest of 7 nests, located at the following distances from the built elements of the wind farm (wind turbines):

- approx. 1149 m from Nest 1 to turbine LU 11
- approx. 1240 m from Nest 2 to turbine LU 10
- approx. 1386 m from Nest 3 to turbine LU 10
- approx. 1651 m from Nest 4 to turbine LU 9
- approx. 1435 m from Nest 5 to turbine ME 5
- approx. 965 m from Nest 6 to turbine TO 4
- approx. 1670 m from Nest 7 to turbine TO 4

We mention that the requirements regarding the expansion of the analyzed area up to 6 km (according to the SNH guide) within the forest habitats have arisen far too late, after the end of the monitoring session March - June 2013. Meanwhile, the SNH guide mentions that monitoring within a radius of 6 km is executed in the case of the presence in the area of long home range species. In our case, the only species that falls under this category is *Haliaeetus albicilla*. The habitat of this species is represented by vast wetlands (large rivers, lakes with meadow forests and

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groves with large and old trees). *Haliaeetus albicilla* feeds on fish and water birds that it catches from rivers and slow flowing canals or lakes, sometimes from agricultural fields, especially in winter. At present, no more than 12-18 pairs nest in Romania, most of them in the Danube Delta area (D.Munteanu, 2009). The potential feeding areas for this species can be represented by: Lake Babadag, Razelm - Sinoe complex, the Danube Delta, the Danube floodplain. If we consider the Babadag Forest as a nesting place for the concerned species, the nearest potential feeding places are Lake Babadag and Razelm - Sinoe complex to the East, approximately 3 km from the forested area. Given its preferential feeding areas, it is most likely that any nests of this raptor species from Babadag forest are located in the East of the forest.

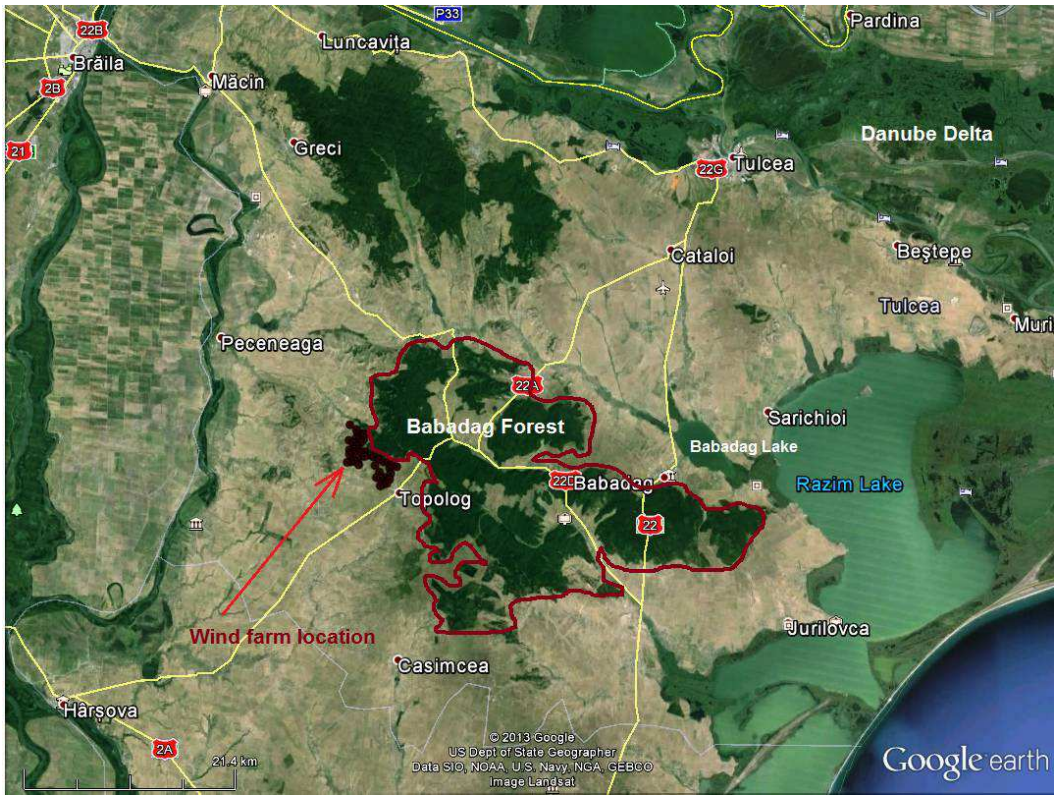

Figure 24. The location of Dorobantu-Topolog wind farm, in relation with Babadag Forest

Absence of nests in the wind farm nearby was confirmed during the nest survey, carried out in Spring 2013.The requirement of the SNH guide, regarding the survey distance of 2 km recommended for the other species of raptors, was met during the monitoring program.

Vantage points

When selecting the vantage points, those points that offer a great view of the wind farm site and of the surroundings were taken into account from the beginning of the observations in the study area. The 3 points chosen for observations in 2006-2012 were also used in the monitoring from March-June 2013. Although it is known that VP choice must be done outside the studied area, so that observers do not disturb the birds, the studied area offered few optimal possibilities

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for meeting these requirements. Therefore, if other vantage points would have been used, from outside the study area, their number would have needed to be larger in order to cover the entire study area, which would have implied more staff, and a larger disturbance of the species outside the study area. Furthermore, the agricultural activities carried out both on arable land and on pasture lands, which also translate into a frequent human presence, have been influencing the qualitative and quantitative structure of avifauna in the study area for a long time.

It must also be mentioned that the location of the vantage points is at about 2 km from the nests of raptors identified in the forest area.

Over the period 2006-2012, two vantage points were generally used during the nesting period, and three during the migration period. Over the period March-June 2013, two vantage points were used in March, and 3 vantage points were used in April, May and June.

Observations from 2006-2012 were conducted for both the target species and for the secondary species and, in 2013, for the study of the spring migration and of the beginning of the nesting period of birds from the analyzed area, the focus was on target species potentially affected due to their behavior, flight pattern and biology - raptors, water birds and other large birds.

Transects survey

Unlike the methodology applied during 2006-2013 in which four transects within the site were covered, in the spring of 2013, trips were made on five transects, thus covering a larger area of the studied site.

The design of the field sheets in 2013 has been improved, in order to allow the direct count of specimens depending on the direction of observation (left or right), and an estimate of the distance from the observer to the observed species.

Maps of the distribution of the species observed in the studied area based on observations carried out on transects were also drawn up in 2013.

4.2. Bats

According to the „*EU Guidance on wind energy development in accordance with the EU nature legislation*" „The concern over the potential impacts of wind farms on bat species has increased in recent years, particularly in relation to the risk of collision with rotors or turbine towers, and barotrauma caused by rapid air-pressure reduction near moving turbine-blades".

The estimation of the presence and abundance of the populations of bats at a species level was necessary for a correct evaluation of the sensitivity of the studied area, at the potential impact of the infrastructure of the wind farm.

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4.2.1. Definition of target species

The target species identified are represented by the protected species/species of conservative interest potentially present in the analyzed area. In order to determine the target species, the lists from the *Habitats Directive 92/43/EEC*, *Bonn Convention*, *Berna Convention GEO 57/2007*, *IUCN Red List*, *Red Book of Vertebrates* from Romania (2005), *EU Guidance on wind energy development in accordance with the EU nature legislation* were taken into consideration.

According to information from literature, 30 species of bats are present in Romania, protected both by the national and European legislation.

Table 14. The list of bat species from Romania and their protection status

Bat species in Romania	GEO 57/2007	Habitats Directive 92/43/EEC	Bonn Convention	Bern Convention	IUCN Red List	Red Book (2005)
Barbastella barbastellus	Annex 3, 4A	Annex II, IV	Annex II	Annex II	NT	VU
Eptesicus nilssonii	Annex 4A	Annex IV	Annex II	Annex II	LC	CR
Eptesicus serotinus	Annex 4A	Annex IV	Annex II	Annex II	LC	VU
Hypsugo savii	Annex 4A	Annex IV	Annex II	Annex II	LC	VU
Miniopterus schreibersii	Annex 3, 4A	Annex II,IV	Annex II	Annex II	NT	VU
Myotis bechsteinii	Annex 3, 4A	Annex II, IV	Annex II	Annex II	NT	EN
Myotis blythii	Annex 3, 4A	Annex II, IV	Annex II	Annex II	LC	EN
Myotis brandtii	Annex 4A	Annex IV	Annex II	Annex II	LC	EN
Myotis capaccinii	Annex 3, 4A	Annex II, IV	Annex II	Annex II	VU	EN
Myotis dasycneme	Annex 3, 4A	Annex II, IV	Annex II	Annex II	NT	EN
Myotis daubentonii	Annex 4A	Annex IV	Annex II	Annex II	LC	CR
Myotis emarginatus	Annex 3, 4A	Annex II, IV	Annex II	Annex II	LC	EN
Myotis myotis	Annex 3, 4A	Annex II	Annex II	Annex II	LC	EN
Myotis mystacinus	Annex 4A	Annex IV	Annex II	Annex II	LC	EN
Myotis nattereri	Annex 4A	Annex IV	Annex II	Annex II	LC	EN
Nyctalus lasiopterus	Annex 4A	Annex IV	Annex II	Annex II	NT	EN
Nyctalus leisleri	Annex 4A	Annex IV	Annex II	Annex II	LC	EN
Nyctalus noctula	Annex 4A	Annex IV	Annex II	Annex II	LC	-
Pipistrellus kuhlii	Annex 4A	Annex IV	Annex II	Annex II	LC	-
Pipistrellus nathusii	Annex 4A	Annex IV	Annex II	Annex II	LC	EN
Pipistrellus pipistrellus	Annex 4A	Annex IV	Annex II	Annex III	LC	-
Pipistrellus pygmaeus	Annex 4A	Annex IV	Annex II	Annex II	LC	-
Plecotus auritus	Annex 4A	Annex IV	Annex II	Annex II	LC	VU
Plecotus austriacus	Annex 4A	Annex IV	Annex II	Annex II	LC	EN
Rhinolophus blasii	Annex 3, 4A	Annex II, IV	-	Annex II	LC	EN
Rhinolophus euryale	Annex 3, 4A	Annex II, IV	-	Annex II	NT	EN
Rhinolophus ferrumequinum	Annex 3, 4A	Annex II, IV	-	Annex II	LC	VU
Rhinolophus hipposideros	Annex 3, 4A	Annex II, IV	-	Annex II	LC	VU

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Rhinolophus mehelyi	Annex 3, 4A	Annex II, IV	-	Annex II	VU	EN
Vespertilio murinus	Annex 4A, 4B	Annex IV	Annex II	Annex II	LC	EN

Legend
- Vulnerable (VU)
- Near threatened (NT)
- Least concern (LC)
- Critically endangered (CR)
- Endangered (EN)

After monitoring of the species of bats conducted at the site of the Dorobantu-Topolog wind farm, as well as in the adjacent areas (Babadag forest edge,the mineral prospecting galleries at a distance of 7 km from the site) the following 8 species of bats were identified: *Barbastella barbastellus, Eptesicus serotinus, Myotis daubentonii, Nyctalus noctula, Nyctalus leisleri, Pipistrellus pipistrellus, Plecotus auritus, Rhinolophus ferrumequinum..*

Depending on the presence of the habitats, the ecology of the bat species and on bibliographic information (monitoring reports for other wind farms), we considered that the species: *Myotis myotis* and *Pipistrellus nathusii* could also be present in the analyzed area.

Table 15. Bat species in Romania

Bat species in Romania	**Observed**	**Presence likelihood**
Barbastella barbastellus	*	
Eptesicus nilssonii		
Eptesicus serotinus	*	
Hypsugo savii		
Miniopterus schreibersii		
Myotis bechsteinii		
Myotis blythii		
Myotis brandtii		
Myotis capaccinii		
Myotis dasycneme		
Myotis daubentonii	*	
Myotis emarginatus		
Myotis myotis		*
Myotis mystacinus		
Myotis nattereri		
Nyctalus lasiopterus		
Nyctalus leisleri	*	
Nyctalus noctula	*	
Pipistrellus kuhlii		
Pipistrellus nathusii		*
Pipistrellus pipistrellus	*	
Pipistrellus pygmaeus		
Plecotus auritus	*	
Plecotus austriacus		

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Rhinolophus blasii		
Rhinolophus euryale		
Rhinolophus ferrumequinum	*	
Rhinolophus hipposideros		
Rhinolophus mehelyi		
Vespertilio murinus		

4.2.1.1. Additional information

By taking into account the conservation status of the 10 bat species (8 present in the region and 2 potentially present species) and the fact that they are all listed in Annex III (Bat Behavior in Relation to Wind Farms) of the *EU Guidance on wind energy development in accordance with the EU nature legislation,* we consider that all 10 bat species can be identified as target species.

Table 16. Bat species observed or likelihood presence

Bat species observed or likelihood presence	Annex III EU Guidance on wind energy
Barbastella barbastellus	*
Eptesicus serotinus	*
Myotis daubentonii	*
Myotis myotis	*
Nyctalus leisleri	*
Nyctalus noctula	*
Pipistrellus nathusii	*
Pipistrellus pipistrellus	*
Plecotus auritus	*
Rhinolophus ferrumequinum	*

4.2.2. Definition of survey method

Monitoring of the bats in the studies area, which has already been defined in *Chapter 4. Design of field survey*, aimed to identify potential bat species present in the wind farm area, depending on the their habitat type and behavior peculiarities. Field observations were also conducted, in order to identify potential areas of shelter (caves, trees, old houses).

The monitoring methods used between 2006-2013 were based on an initial set of criteria, that later defined the effort made in the monitoring of the bats from the analyzed area. These criteria, such as site characteristics related to: weather conditions (windy), elevation, habitat characteristics, the presence shelter areas, led to the following opinion, that: the implementation of Dorobantu-Topolog wind farm presents a low risk of impact on bats. Therefore, the effort has been calibrated according to the initial opinion, which was confirmed by the subsequent results, following the onsite visits.

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This initial opinion is also supported by the EUROBATS Guide (Rodrigues et al., 2008), and Bat Surveys Good Practice Guidelines al Bat Conservation Trust (Hundt L., 2012) guides, as shown in the following table:

Table 17. Bat usage of site: Criteria to set survey effort (*source: Natural England Technical Information Note TIN051, 2-nd ed. 29.02.1012*)

Risk	**Low**	**High**
Site size	Small	Small or large
Site feature	Windy, higher altitudes	Less windy
Habitat	Open, at least 100 m from suitable habitat (such as, but not restricted to, woodland, waterbodies or liniar features)	Suitable habitat features (such as, but not restricted to, woodland, waterbodies or linear features) are on or adjacent to site
Roost on or bounding site	Very few or none	Several. Risk will increase with significance of roost type or species , especially high risk species
Likely threat to bats	Low-medium	High

Regarding the characteristics of the site of the wind farm, we mention again that: it is represented by arable land and pastures, in a windy area, the closest locations of the wind turbines are at more than 100 m from the forest, and there are no shelter locations for bats on site (karst areas, anthropogenic structures, old trees).

4.2.2.1. Survey methods: Period 2006-2012

The observations from the site of the wind farm on bats were first made during the elaboration of Appropriate Assessment study, by using bioacustic surveillance methods.

The ultrasonic detector BATBOX Duet was used for monitoring the chiropters, with the related software (BatScan), in order to determine an index of activity for each habitat of the studied area, and the activity index (the number of bats registered per hour). Also, direct observations were made by using the infrared Baigish 32 M spotting scope.

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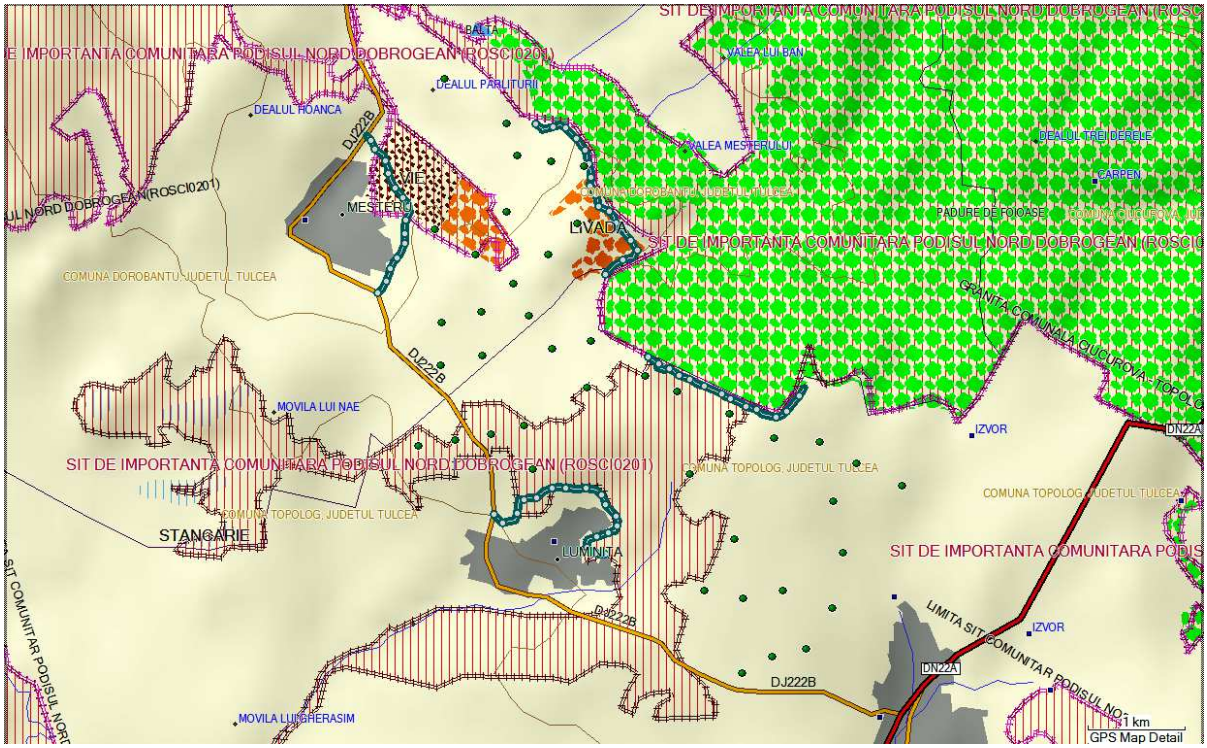

Figure 25. Transects for chiropters observation (2012)

4.2.2.2. Survey methods: Period 2013

The methods used for the inventory of the bats observe the most popular international standards, including the EUROBATS Guide (Rodrigues et al., 2008), and Bat Surveys Good Practice Guidelines al Bat Conservation Trust (Hundt L., 2012).

The bat detectors are technical instruments which allow the hearing and registration of the ultrasounds emitted by bats during flight, through the very sensitive microphones.

The inventory of the species of Chiroptera was performed with the help of the Pettersson Ultrasound Detector D1000X and BATBOX Duet ultrasound detectors, the registration of the ultrasounds being performed from fixed points. For the subsequent analysis of the records, the program BatSound 4.2 was used.

Between March – June, the studies of bioacoustics were performed in two periods: the period March – April, when the bats migrate from their hibernation place to their summer place of refuge, and the period at the end of June, a period of maximum activity of the bats.

The monitoring session was performed through the registration of all sounds of echolocation of the bats, from the wind farm and in its vicinity, on a number of 18 points during each period, to which additional points are also added (7) in the vicinity of the forestry habitats (Babadag Forest) and of the localities. The monitoring points were the followings:

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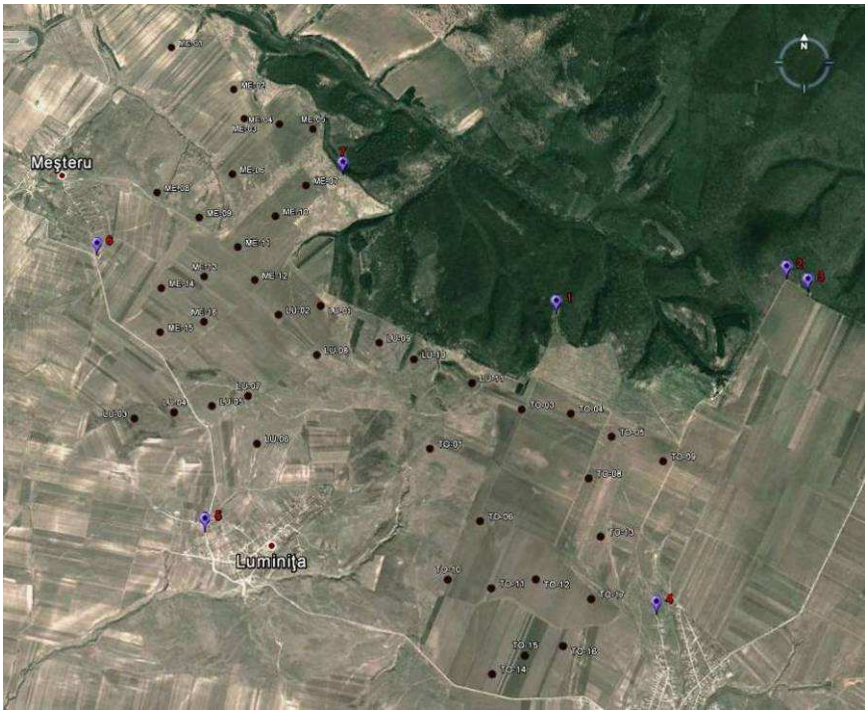

Figure 26. Observation points outside of the site

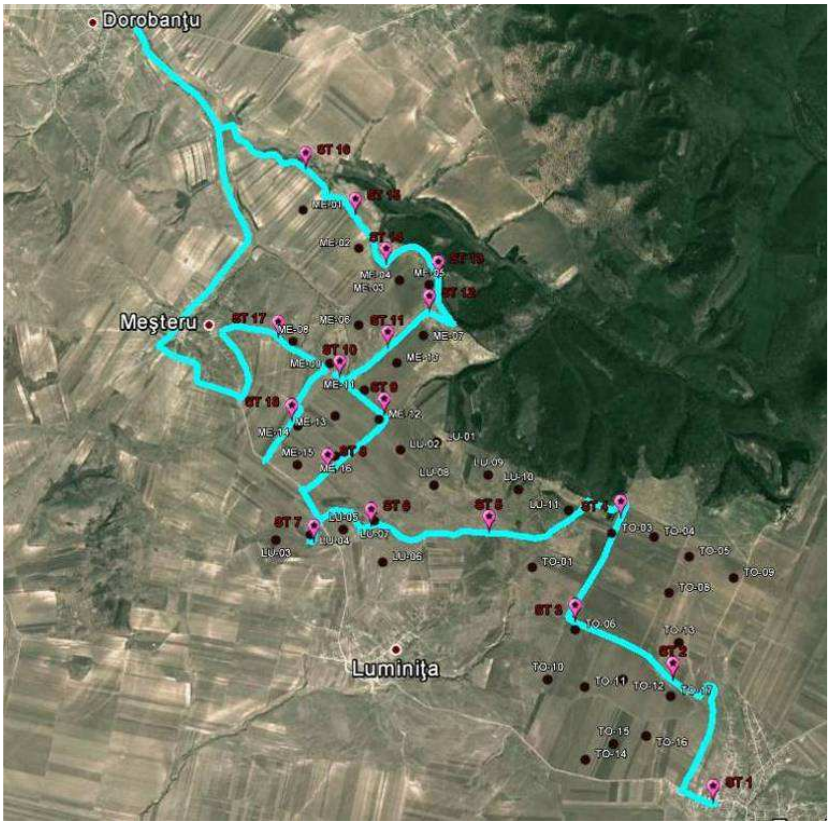

Figure 27. Observation points and the transect crossed on the site

The duration of each registration period at the level of each point was up to 30 minutes. Rainy nights or nights with strong wind were avoided for the performance of the registrations.

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The supervision of the places of refuge

A study was also performed for the supervision of the places of refuge, in order to correctly evaluate the sensitivity of the studied area regarding the potential impact of the infrastructure. So, an inspection of all possible places of refuge, of sites which can be used by bats as places of refuge was performed, such as: caves, barns and other rural constructions, abandoned constructions, historical constructions, attics of the rural buildings, bridges over waters, etc. This inspection was performed on an area of 2 to 5 km around the area proposed for the building of the wind farm. therefore, two abandoned mine galleries were identified in the area of the border of Cerna (N44 99990 E28 2813) and Vararia Hill (N44 96320 E28 30854).

At the end of June, an inspection was performed for the identification of the potential presence in the places of refuge of the breeding colonies. During the inspections, the ecological use of the places of refuge of bats was registered, as follows: places of refuge for reproduction, hibernation, swarming, being careful not to disturb the activity of the bats present or which could be present in these places of refuge. Signs of the presence of other species of conservative interest were also registered, especially Strigiformes.

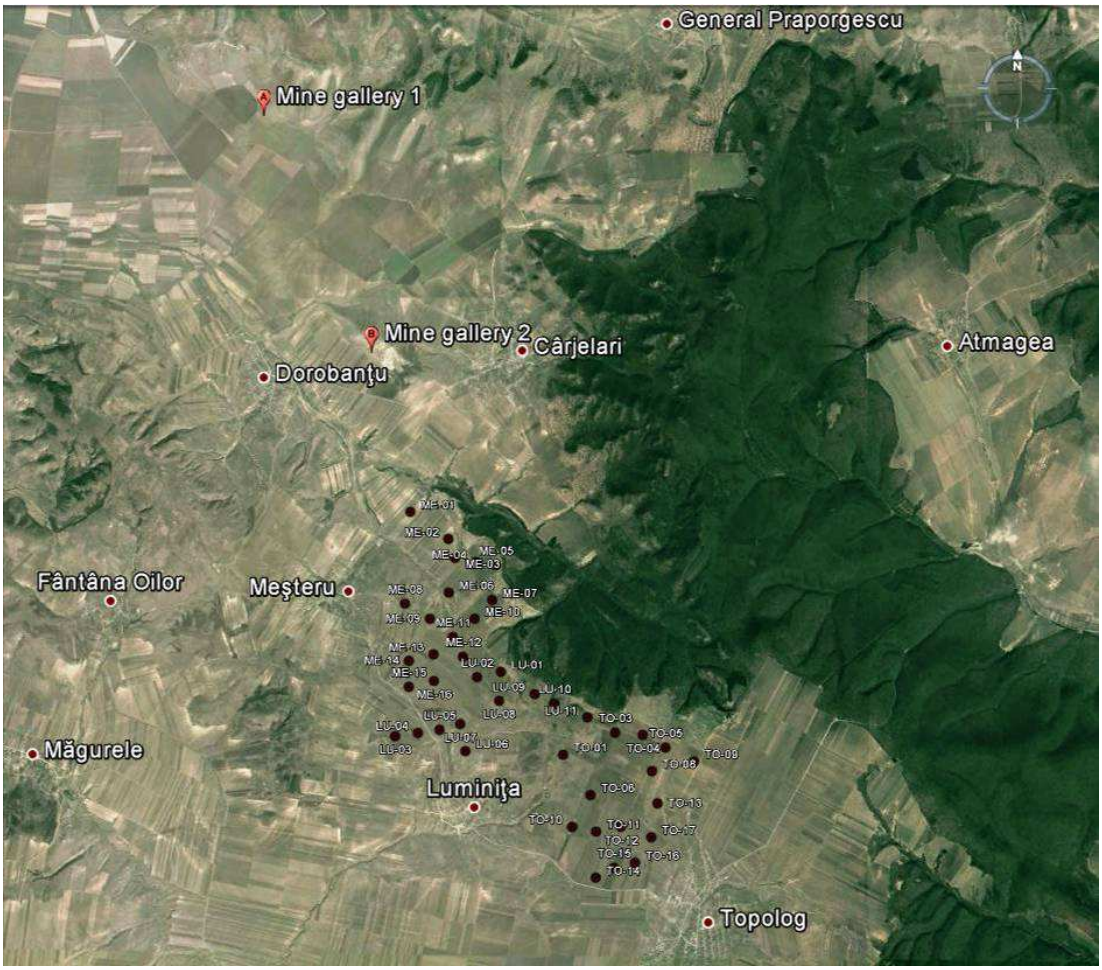

Figure 28. Locations of the two prospection galleries

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4.3. Balance of the activity actually carried out

The monitoring activities in the area of the Dorobantu -Topolog wind farm took place over time, so that they capture all aspects of biodiversity from the studied area. This involved many hours spent in the field over the years, so that between October 2006 - January 2013, a number of 216 were field trips were performed, with a total number of 1597 working hours, which included both trips for monitoring wildlife (invertebrates, amphibians, reptiles, birds, mammals) and for flora and habitat monitoring. For the monitoring from March-June 2013, the focus was on the diversification of methodologies regarding the exclusive monitoring of birds and bats, but for which information on habitats present in the area, as well as their evolution over time was also required.

The biodiversity monitoring activities carried out during 2006-2012 in the area of the Dorobantu-Topolog wind farm were carried out so that they meet legislative requirements applicable nationwide. Therefore, the studies of Environmental Impact Assessment, including the Appropriate Assessment were conducted according to the framework structures imposed, and entailed collecting and then processing the data, so that it meets the requirements of the Romanian authority responsible. During the monitoring period March - June 2013, the methodologies recommended by the Scottish Guideline, EU Guideline and by other guidelines and instruments widely accepted at an international level, according to the financial - banking requirements, were adopted.

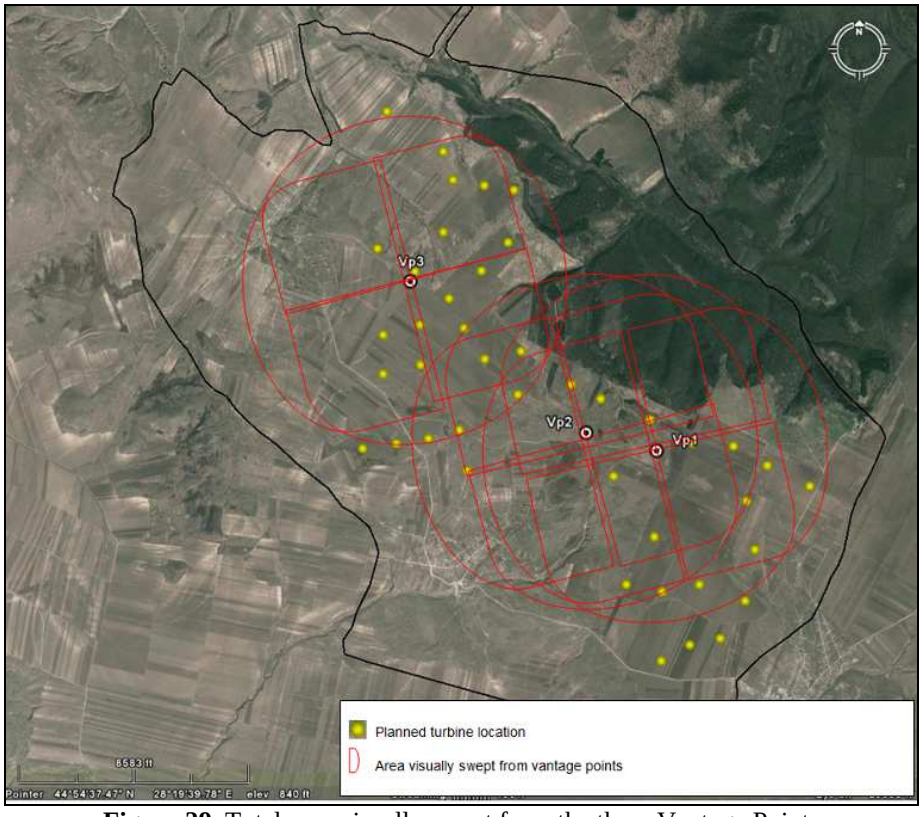

Figure 29. Total area visually swept from the three Vantage Points

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The three Vantage Points (Image A) cover, as shown, about 98% of the entire surface afferent to the project. The locations of three turbines from the Topolog area (TO-14, TO-15, TO-16) are virtually outside of the area observable from the nearest Vantage Point (VP1). However, the area where these three turbines will be located was kept under observation with the help of a spotting scope, and it was possible to carry out ornithological observations regarding the activity of birds, including (thanks to the altitude at which the VP is located) for the areas from the periphery of Topolog locality.

For the period 2012-2013, observations from Vantage Points were made by three specialists in each VP.

For the period 2012, observations were made mainly from VP 2 and VP 3 but, starting with March of 2013, all three VP were covered by three specialists (by two observers with optical equipment and an observer equipped with a professional camera). The two observers covered 180° each, located preponderantly on the directions of two cardinal points each. At 3 hour intervals, the observers and their position was changed and the supervised areas were rotated, in order to comprise, as completely and accurately as possible, an area of 360°.

Table 18. Overview of the total observation time

Season	Date	VP1	VP2	VP3	General Observations	Transect 1	Transect 2	Transect 3	Transect 4	Transect 5	No. of. researchers
Winter time 2012	14.01.2012	0	0	0	4.31	0	0	0	0	0	6
	27.02.2012	0	0	0	4	0	0	0	0	0	
	5.12.2012	4	5	0	0	0	0	0	0	0	
	11.12.2012	4.3	4	0	0	0	0	0	0	0	
Spring migration 2012	13.03.2012	6.18	6.26	5.25	0	0	0	0	0	0	10
	20.03.2012	6.38	4.38	4.34	0	0	0	0	0	0	
	25.03.2012	4.21	4.34	4.9	0	0	0	0	0	0	
	10.04.2012	3.28	4.32	3.34	0	0	0	0	0	0	
	12.04.2012	0	0	0	0	2.15	2.19	3.36	2.48	0	
	25.04.2012	4.15	4.21	4.46	0	0	0	0	0	0	
	27.04.2012	3.19	3.29	3.32	0	0	0	0	0	0	
	30.04.2012	5.04	4.12	4.9	0	0	0	0	0	0	
Breeding season 2012	11.05.2012	0	7.57	7.3	0	0	0	0	0	0	8
	22.05.2012	0	0	0	0	2.23	2.19	4.53	2.39	0	
	9.06.2012	0	0	0	0	2.21	1.59	3.25	2.18	0	
	18.06.2012	0	3.46	3.59	0	0	0	0	0	0	
	16.06.2012	0	0	0	0	2.5	1.56	3.19	2.14	0	
	26.07.2012	3.21	0	2.25	0	0	0	0	0	0	
Resting time 2012	16.08.2012	0	0	0	0	2.9	2.7	2.4	2.2	0	8
	23.08.2012	1.37	0	2.33	0	0	0	0	0	0	
	16.08.2012	0	0	0	0	2.9	2.7	2.4	2.2	0	
	23.08.2012	1.37	0	2.33	0	0	0	0	0	0	
	03.11.2012	4.31	3	0	0	0	0	0	0	0	
	12.11.2012	3	6.15	0	0	0	0	0	0	0	
	28.11.2012	4	4.3	0	0	0	0	0	0	0	
Autumn	05.09.2012	5	3	3	0	0	0	0	0	0	8

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migration 2012	11.09.2012	3	3	3	0	0	0	0	0	0	
	24.09.2012	3	3	4	0	0	0	0	0	0	
	02.10.2012	5	5	3	0	0	0	0	0	0	
	12.10.2012	3	2.2	3	0	0	0	0	0	0	
	18.10.2012	3	3	3	0	0	0	0	0	0	
Winter time 2013	21.01.2013	0	0	0	5	0	0	0	0	0	6
	21.02.2013	0	0	0	5	0	0	0	0	0	
Spring migration 2013	16.03.2013	8	8	0	0	0	0	0	0	0	9
	31.03.2013	0	8.11	8.5	0	0	0	0	0	0	
	20.04.2013	0	0	0	0	3.26	1.52	1	2.01	2.22	
	06.04.2013	7.2	7.25	7.1	0	0	0	0	0	0	
	13.04.2013	6.55	8.01	8	0	0	0	0	0	0	
	23.04.2013	6.36	6.25	8	0	0	0	0	0	0	
	29.04.2013	8.52	8.11	8	0	0	0	0	0	0	
Breeding season 2013	02.05.2013	8	8	8	0	0	0	0	0	0	9
	09.05.2013	8	8.31	8.22	0	0	0	0	0	0	
	18.05.2013	8	7.15	8	0	0	0	0	0	0	
	23.05.2013	0	0	0	0	1.37	2.15	2.35	2.02	1	
	28.05.2013	8	7.37	8	0	0	0	0	0	0	
	08.06.2013	8	8.31	8	0	0	0	0	0	0	
	20.06.2013	9.15	8.11	9.21	0	0	0	0	0	0	

The observation period between January 2012 and June 2013 has been divided into several distinct seasons (table 18). This was dictated by the pattern of activity of the species, the observations carried out, the literature data and personal experience of the experts involved in the inventory and monitoring activities. Therefore, eight distinct periods resulted, each with specific features.

In terms of research effort, we note that six specialists were involved in the monitoring and inventory activity in the Winter time 2012 period, 10 specialists in the Spring Migration 2012, eight specialists in 2012 Breeding season, eight specialists in Resting time in 2012, eight specialists in Autumn migration 2012, while six specialists were involved in the 2013 Winter time period , and 9 specialists in each of the Spring migration 2013 and Breeding season 2013 periods.

Table 19. Overview of the observation time in the case of bats and nocturnal birds

	Date	**Hours of observation**	**Number of researchers**
Bioacustic and nocturnal birds survey 2013	27.03.2013	2	4
	29.04.2014	6	4
	22.05.2013	8	4
	19.06.2013	7	4
Roost survey 2013	30.05.2013	8	2
	04.06.2013	8	2
	12.06 2013	8	2
Roost survey 2012	17.06.2012	2	2
	03.07.2012	3	2
	29.08.2012	2	2

For the monitoring activity of bat species and nocturnal bird species, a total number of 54 hours have been assigned, broken down as shown in table 19. Over the entire 2012-2013 study

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period, in the inventorying and monitoring of species, 4 specialists were involved for each of the bioacustic and nocturnal birds survey activity, and 2 for the roost survey activity.

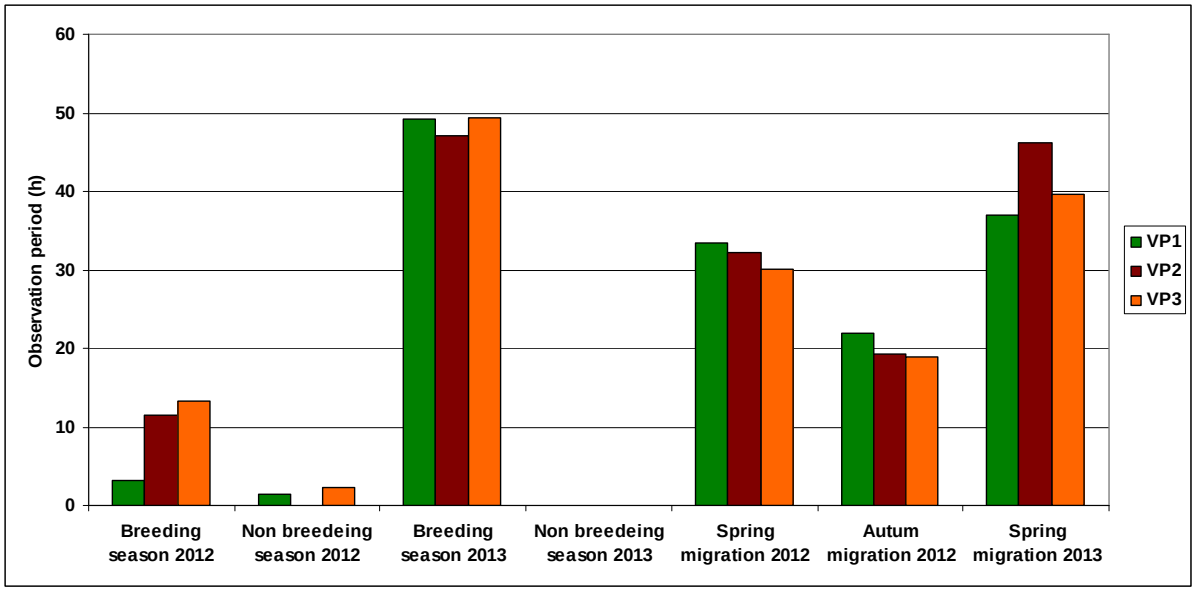

Figure 30. Distribution of the observation time in three Vantage Points in seven observation period

Regarding the duration of the observation from the VP, the activity is graphically illustrated in figure 30. Therefore, it can be observed that the greatest number of hours was spent mainly in the breeding season 2013 period, and spring migration (both 2012 and 2013). A significant number of observation hours (approximately 60 hours) were also conducted during autumn migration 2012. The greatest number of observation hours was carried out during breeding season 2013 (about 150), in order to accurately determine the number of species/specimens belonging to them which nest within the site of the future project.

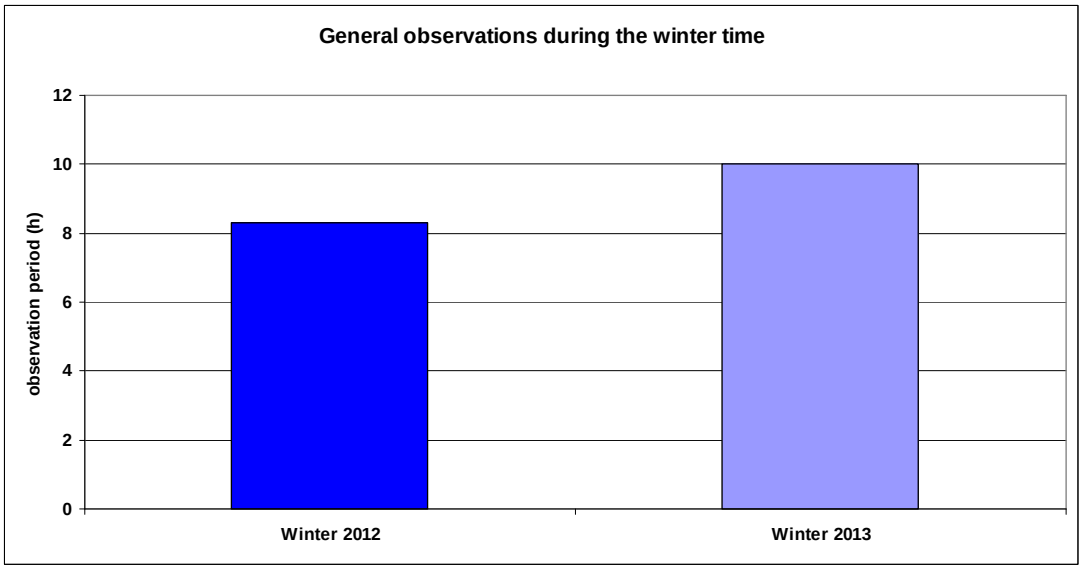

Figure 31. Distribution of the observation time during the winter time

The period with the lowest activity (in terms of taxonomic groups of interests) is the hyemal period. Thus, during this period, observations were limited to general ones, made by

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covering some routes in the future project area, and recording the data from the observations on the general field sheets. A graphical analysis of that period mentioned can be seen in figure 31. For the mentioned period, the number of hours allocated was on average three per day in the field. In total, the number of hours allocated to general character observations was about 20, for the period 2012-2013 (two field visits distributed for each of January and February 2012 and 2013). We mention that in December 2012, the observations were made from VP, in order to capture the activity of the winter guests.

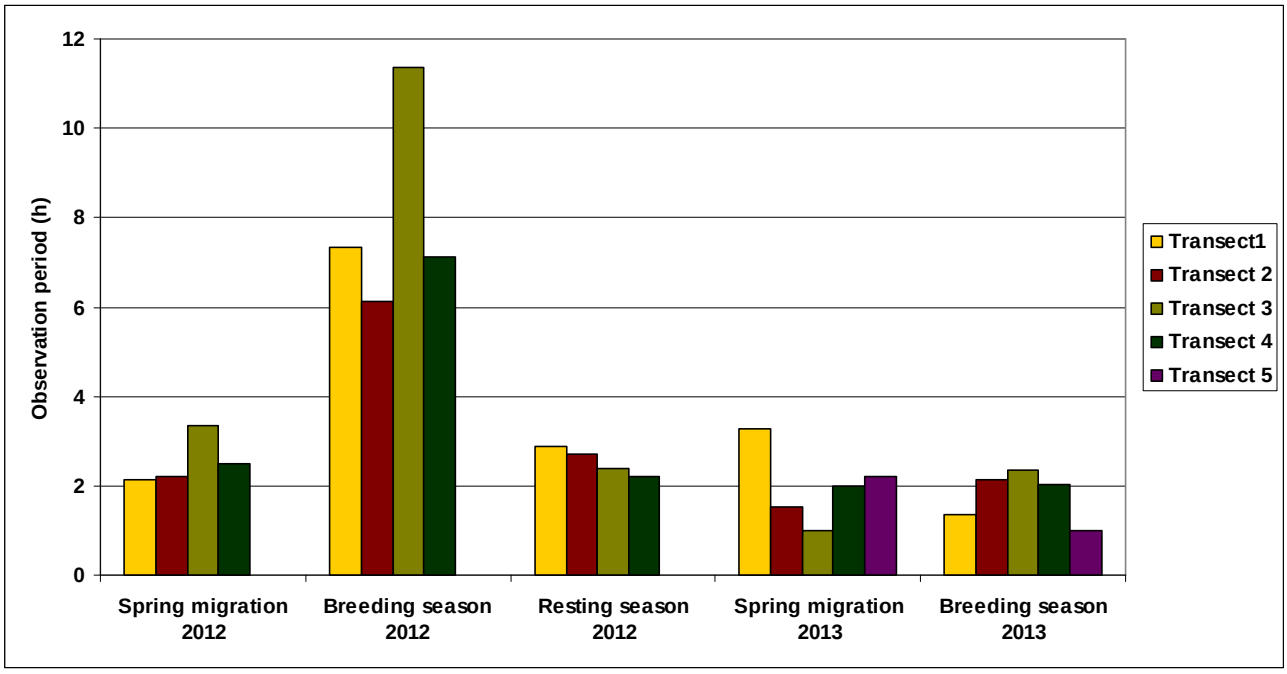

Figure 32. Distribution of the observations time on transects during the entire survey period

From the point of view of the research activity using the transect method, we note that in 2012 four such transects were monitored, and in 2013 their number was supplemented with another one, in order to cover the surface of the future wind farm as well as possible. Therefore, for the Spring migration 2012, the number of hours of research was of approximately 11 hours, while for the Breeding season 2012, the number of research hours on transects was of about 33. For 2013, the number of hours of transects investigation was about 10 hours for the Spring season and about 9 hours Breeding season. For the one season correspondent to resting (in 2012), the number of hours spent in the field in research on transects was of about 10 hours.

We mention that we generically called "resting season" the period between August 1st and August 30th and November 1st and December 1st . In the first stage (that from late summer), nesting birds have finished raising the young and, along with them, they change plumage either in view of the migration, or of the dispersal in territory.

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5. BASELINE DEFINITION

This study was based on information and data gathered through the fieldwork carried out between January 2012 and June 2013, which were complemented by monitoring results from the previous stage (2006-2013). In addition to information obtained through fieldwork, the study employed bibliographical information. The methodological guidelines regarding the procedures for setting up wind farms informed the processing and analysis of the data.

We find it necessary to point out that throughout the elaboration of the study we attempted to overcome the difficulties stemming from contradictory information coming from different sources, and to bring these to a unitary form (ex.: Standard Data Form, Red lists, Red Books, different guidelines and publications).

5.1. Birds

In this section outlines the results of the baseline study. The baseline description is based on:

- Desk-based study of existing information;
- Appraisal of habitats and species likely to be present;
- Reconnaissance survey.

5.1.1. Species included in the lists of the NATURA2000 Sites

The table below outlines information regarding the resident, breeding or wintering bird species, listed in the Data Form of SPA Padurea Babadag.

Table 20. Estimation of Romanian resident , breeding or wintering bird population and SPA's population

Crt.no	Binomial Name	Romania (pairs or individuals/years)*Estimated population in	Estimated population in SPA		
			Resident	Breeding	Wintering
1	*Accipiter brevipes*	60-100 p (1999-2002)		60-100 p	
2	*Anthus campestris*	150.000-220.000 p (2000-2002)		1600-2000 p	
3	*Aquila pomarina*	2.500-2.800 p (1996-2002)		15-30 p	
4	*Bubo bubo*	750-1.000 p (1990-2002)		1-4 p	
5	*Burhinus oedicnemus*	400-800 p (1990-2002)		35-50 p	
6	*Buteo lagopus*	500-2000 i (1990-2000)			R
7	*Buteo rufinus*	65-110 p (2000-2002)		15-30 p	
8	*Calandrella brachydactyla*	10.000-12.000 p (2000-2002)		200-300 p	
9	*Caprimulgus europaeus*	12.000-15.000 p (2000-2002)		C	
10	*Carduelis chloris*	850.000-910.000 p (1999-2002)		RC	

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11	*Circaetus gallicus*	220-300 p (1995-2002)		20-30 p	
12	*Circus cyaneus*	150-500 i (1990-2000)			20-30 i
13	*Circus pygargus*	0-12 p (1990-2002)		0-3 p	
14	*Columba palumbus*	12.000-16.000 p (1990-2002)		C	
15	*Coracias garrulus*	4.600-6.500 p (2000-2002)		400-500 p	
16	*Cuculus canorus*	400.000 -800.000 p (1990-2002)		C	
17	*Dendrocopos medius*	20.000-24.000 p (2000-2002)	500-620 p		
18	*Dryocopus martius*	40.000-60.000 p (2000-2002)	60-80 p		
19	*Emberiza hortulana*	125.000-255.000 p (2000-2002)		600-800 p	
20	*Falco cherrug*	5-10 p (1990-2002)		1-2 p	
21	*Haliaeetus albicilla*	28-33 p (1995-2002)		1 p	
22	*Hieraaetus pennatus*	80-120 p (1990-2002)		20-30 p	
23	*Hippolais icterina*	60.000-75.000 p (2000-2002)		RC	
24	*Hirundo rustica*	800.000-1.000.000 p (2000-2002)		P	
25	*Lanius collurio*	1.380.000-2.600.000 p (2000-2002)		C	
26	*Lanius excubitor*	14.000-17.000 p (2000-2002)			R
27	*Lanius minor*	364.000-857.000 p (2000-2002)		RC	
28	*Lanius senator*	40-80 p (2000-2002)		P	
29	*Lullula arborea*	65.000-87.000 p (2000-2002)		RC	
30	*Melanocorypha calandra*	85.000-105.000 (2000-2002)		800-1500 p	
31	*Motacilla alba*	1.500.000-1.900.000 p (2000-2002)		C	
32	*Motacilla flava*	800.000-1.200.000 p (1997-2002)		RC	
33	*Muscicapa striata*	350.000-450.000 p (2000-2002)		RC	
34	*Oenanthe isabellina*	500-700 p (2000-2002)		20-30 p	
35	*Oenanthe oenanthe*	225.000-343.000 p (2000-2002)		C	
36	*Oriolus oriolus*	680.000-890.000 p (2000-2002)		C	
37	*Parus lugubris*	15.000-25.000 p (2000-2002)	700-800 p		
38	*Phoenicurus phoenicurus*	160.000-190.000 (2000-2002)		RC	
39	*Phylloscopus collybita*	980.000-1.600.000 p (2000-2002)		C	
40	*Phylloscopus sibilatrix*	260.000-460.000 p (2000-2002)		RC	
41	*Picus canus*	45.000-60.000 p (2000-2002)	200-300 p		
42	*Saxicola torquata*	164.000-240.000 p (2000-2002)		RC	
43	*Streptopelia turtur*	15.000-25.000 p (1990-2002)		C	
44	*Sturnus vulgaris*	840.000-1.224.000 p (2000-2002)		C	
45	*Sylvia atricapilla*	650.000-900.000 (2000-2002)		RC	
46	*Sylvia curruca*	860.000-1.100.000 (2000-2002)		RC	
47	*Sylvia nisoria*	25.000-40.000 p (1990-2000)		300-400 p	
48	*Tadorna ferruginea*	20-25 p (1990-2002)		3-7 p	
49	*Upupa epops*	24.000-42.000 p (2000-2002)		C	

Legend
Status:i-individuals;
p-pairs;
Global: Global assessment of the value of the site for conservation of the species concerned
P- present;

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RC- relatively common;
R- rare;
C- common.

Resident, breeding or wintering species observed in the studied area and listed by the Standard Data Form of SPA Padurea Babadag

In order to appraise the size of the resident, breeding or wintering bird species populations at the wind farm sites, the number of birds was fitted into 7 intervals, as follows: 0 individuals; **a**: 1-10; **b**: 10-30; **c**: 30-100; **d**: 100-300; **e**: 300-600; **f**:>600.

Table 21. Estimation of resident, breeding or wintering species population within the boundaries of the wind farm.

Crt.no.	Binomial Name	Observed species effectives approximation	Phenology
1.	*Anthus campestris*	a	breeding
2.	*Calandrella brachydactyla*	b	breeding
3.	*Carduelis chloris*	b	resident/breeding
4.	*Melanocorypha calandra*	b	breeding
5.	*Lanius collurio*	b	breeding
6.	*Lanius minor*	b	breeding
7.	*Lanius excubitor*	a	wintering
8.	*Oenanthe isabellina*	a	resident
9.	*Oenanthe oenanthe*	b	resident
10.	*Sturnus vulgaris*	c	resident

Legend:

Intervals:" –" - 0 individuals; **a**: 1-10; **b**: 10-30; **c**: 30-100; **d**: 100-300; **e**: 300-600; **f**:>600

Following the population size analysis for the bird species included on the lists of the SPA Padurea Babadag Standard Data Form pertaining to the phenological categories 'resident', 'breeding' or 'wintering' and identified at the site of the wind farm, we distinguish the predominance of Passeriformes, their numbers however being insignificant compared to the estimated population size at the national level. The best represented at the site are members of the *Sturnidae* (Starlings), *Alaudidae* (larks), *Laniidae* (Shrikes) and *Fringillidae* (Finches) families.

The same scale used in the case of the wind farm site was employed for estimating population sizes for the resident, breeding or wintering bird species observed in the area under survey. As such, it is important to mention that the studied area, which includes the Babadag forest up to 2 km from the analyzed wind farm as well, also hosts diurnal raptor species, forest species, as well as species characteristic of open areas – pastures and agricultural land. Among the species mentioned by the Standard Data Form of SPA Padurea Babadag, solely the *Sturnus vulgaris* species is found in relatively large numbers, between 100 and 300 individuals, which is

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however a small number compared to the estimated population size at the national level. The least represented are Accipitriformes (Falconiformes), through members of the two large families, Accipitridae (eagles, harriers, buzzards) and Falconidae (falcons), the populations being no larger than 10 individuals.

Table 22. Estimation of resident, breeding or wintering species population in the studied area

Crt. No.	Binomial Name	Observed species effectives in the studied area	Phenology
1.	*Anthus campestris*	c	breeding
2.	*Aquila pomarina*	a	breeding
3.	*Buteo buteo*	a	resident
4.	*Buteo rufinus*	a	breeding
5.	*Calandrella brachydactyla*	c	breeding
6.	*Carduelis chloris*	c	resident
7.	*Circus aeruginosus*	a	resident
8.	*Coracias garrulus*	a	breeding
9.	*Cuculus canorus*	a	breeding
10.	*Dendrocopos medius*	a	resident
11.	*Falco vespertinus*	a	resident
12.	*Hieraaetus pennatus*	a	breeding
13.	*Hirundo rustica*	c	breeding
14.	*Lanius excubitor*	b	wintering
15.	*Lanius collurio*	c	breeding
16.	*Lanius minor*	c	breeding
17.	*Lullula arborea*	b	breeding
18.	*Melanocorypha calandra*	c	breeding
19.	*Oenanthe oenanthe*	c	resident, breeding
20.	*Oenanthe isabellina*	c	resident, breeding
21.	*Saxicola torquata*	a	breeding
22.	*Sylvia atricapilla*	a	breeding
23.	*Streptopelia turtur*	b	breeding
24.	*Sturnus vulgaris*	d	resident, breeding
25.	*Upupa epops*	c	breeding

Legend: Intervals:" –" - 0 individuals; **a**: 1-10; **b**: 10-30; **c**: 30-100; **d**: 100-300; **e**: 300-600; **f**:>600

Further, the study assessed the possibility that some resident, breeding or wintering species found on the Standard Data Form list be present within the area under survey, based on the

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presence of characteristic habitats or vegetation. The table below reveals that at the wind farm site there are nesting habitats similar to those described in literature pertaining to only 16 species (out of a total of 49). Nevertheless, across the entire perimeter under survey, nesting habitats for a total of 42 species were found.

By analyzing the presence of feeding habitats in the area, it was determined that as many as 46 of the 49 species may come down within the area under survey for feeding purposes, 39 of which may reach the wind farm site.

Table 23. Assessment of the likelihood to find the species in the studied area based on the presence habitat/vegetation

No.	Species SPA Padurea Babadag	Nesting habitat (from scientific literature)	Feeding habitat (from scientific literature)	Habitats present on site		Habitats present in the studied area	
				Nesting habitat	Feeding habitat	Nesting habitat	Feeding habitat
1.	*Accipiter brevipes*	thin forest	forests, arable land	-	*	*	*
2.	*Anthus campestris*	Arable land, pastures, wetlands, stony areas with bushes	Arable land, pastures	*	*	*	*
3.	*Aquila pomarina*	forests interspersed with open areas, near water	pastures, arable land	-	*	*	*
4.	*Bubo bubo*	forests, floodplain forests, rocks	pastures, arable land	-	*	*	*
5.	*Burhinus oedicnemus*	pastures with *Euphorbia*, arable land	pastures, arable land	*	*	*	*
6.	*Buteo lagopus*	Mountain area	pastures	-	*	-	*
7.	*Buteo rufinus*	pastures, mountain areas	pastures, wetlands	*	*	*	*
8.	*Calandrella brachydactyla*	pastures, arable land	pastures, arable land	*	*	*	*
9.	*Caprimulgus europaeus*	Forests	Arable land, forests, wetlands, pastures	-	-	*	*
10.	*Carduelis chloris*	pastures, scrubs, forest edges	forest edges	*	*	*	*
11.	*Circaetus gallicus*	forests thatalternate withopen areas	pastures, arable land	-	*	*	*
12.	*Circus cyaneus*	forests near to water bodies, wetlands	Arable land, pastures, wetlands	-	*	-	*
13.	*Circus pygargus*	wetlands, arable land	pastures, arable land	*	*	*	*
14.	*Columba palumbus*	Forests	Arable land	-	*	*	*
15.	*Coracias garrulus*	steep banks, floodplain forests	forest edges, pastures, arable	-	*	*	*
16.	*Cuculus canorus*	in the nests of other birds	forests, wetlands, scrubs	-	-	*	*
17.	*Dendrocopos medius*	forests	Forests	-	-	*	*
18.	*Dryocopus martius*	forests	Forests	-	-	*	*

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19.	*Emberiza hortulana*	forest edges, arable land, scrubs	Arable land	*	*	*	*
20.	*Falco cherrug*	Wetlands, meadow forests, sparse trees	forest edges, wetlands	-	-	-	-
21.	*Haliaeetus albicilla*	meadow forests, wetlands	Wetlands	-	-	-	-
22.	*Hieraaetus pennatus*	forests, meadow forests with open areas	pastures, arable	-	*	*	*
23.	*Hippolais icterina*	forests, scrubs, orchard	Edges of sparse woods, scrubs, wetlands	-	*	*	*
24.	*Hirundo rustica*	inhabited areas	Arable land, pastures	-	*	*	*
25.	*Lanius collurio*	scrubs, forests	pastures, forests	*	*	*	*
26.	*Lanius excubitor*	scrubs, forests	pastures	*	*	*	*
27.	*Lanius minor*	Scrubs, forests	pastures	*	*	*	*
28.	*Lanius senator*	Scrubs, floodplain forests	pastures	*	*	*	*
29.	*Lullula arborea*	edge of forests	pastures, scrubs	-	*	*	*
30.	*Melanocorypha calandra*	pastures, arable	pastures, arable land	*	*	*	*
31.	*Motacilla alba*	Pastures near wetlands, inhabited areas	pastures, arable land, wetlands	-	*	-	*
32.	*Motacilla flava*	wetlands	pastures, wetlands, arable land, scrubs	-	*	-	*
33.	*Muscicapa striata*	forest edges bordered by farmland	forest edges, arable land	-	*	*	*
34.	*Oenanthe isabellina*	stony areas	pastures	-	*	*	*
35.	*Oenanthe oenanthe*	stony areas	pastures	-	*	*	*
36.	*Oriolus oriolus*	forests along water bodies or rivers, forests	pastures, wetlands	-	*	*	*
37.	*Parus lugubris*	Forest edges, scrubs	forest edges, scrubs	*	*	*	*
38.	*Phoenicurus phoenicurus*	forests- uses the nests of other species, inhabited areas, scrubs along forest edges	forests, scrubs	-	*	*	*
39.	*Phylloscopus collybita*	Areas along forest edges (*Rubus fruticosa, Prunus spinosa*), areas along forest edges (*Rubus fruticosus, Prunus spinosa*)	forest edges, scrubs	-	*	*	*
40.	*Phylloscopus sibilatrix*	forests	forests	-	-	*	*
41.	*Picus canus*	forests, floodplain forests	forests	-	-	*	*
42.	*Saxicola torquata*	Arable land, scrubs, wetlands	Arable land, scrubs	*	*	*	*
43.	*Streptopelia turtur*	forests	Arable land	-	*	*	*
44.	*Sturnus vulgaris*	steep banks, inhabited areas	Arable land, pastures	-	*	*	*
45.	*Sylvia atricapilla*	Forests, scrubs (*Sambucus nigra, Rubus fruticosus,*	scrubs (*Sambucus nigra, etc*)	-	-	*	*

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		etc)					
46.	*Sylvia curruca*	forests, scrubs	scrubs	*	*	*	*
47.	*Sylvia nisoria*	scrubs, forest edges	scrubs	*	*	*	*
48.	*Tadorna ferruginea*	wetlands	wetland	-	-	-	-
49.	*Upupa epops*	Thin forests, stony areas, steep banks	arable, pastures, forest clearings	-	*	*	*

Legend: * present; - absent

Migrant (in passage) species observed in the studied area and listed by the Standard Data Form of SPA Padurea Babadag

Table 24. Estimation of Romanian migrant bird population and SPA's population

No.	Binomial name	Estimated population in Romania (pairs or individuals/years)*	Estimated population in SPA
			Passage
1.	*Accipiter nisus*	1.200-1.400 p (1998-2002)	2503-3970 i
2.	*Aquila clanga*	0-2 p(1999-2002)	2-5 i
3.	*Aquila heliaca*	5-10 p (1990-2002)	3-5 i
4.	*Aquila pomarina*	2.500-2.800 p (1996-2002)	4270-8580 i
5.	*Burhinus oedicnemus*	400-800 p (1990-2002)	400-500 i
6.	*Buteo buteo*	28.000-34.000 p (1996-2002)	14675-28487 i
7.	*Ciconia ciconia*	4.000-5.000 p (1996-2002)	35000-122000 i
8.	*Ciconia nigra*	160-250 p (1996-2002)	1877-2123 i
9.	*Circaetus gallicus*	220-300 p (1995-2002)	195-300 i
10.	*Circus aeruginosus*	1.700-2.500 p (1998-2002)	1517-3970 i
11.	*Circus cyaneus*	150-500 i (1990-2000)	110-330 i
12.	*Circus macrourus*	0-6 p (1990-2002)	70-100 i
13.	*Circus pygargus*	0-12 p (1990-2002)	500-830 i
14.	*Falco cherrug*	5-10 p (1990-2002)	6-8 i
15.	*Falco peregrinus*	8-15 p (1990-2002)	2- 4 i
16.	*Falco vespertinus*	1.300-1.600 p (1990-2002)	600-800 i
17.	*Ficedula parva*	360.000-512.000 p(2000-2002)	500-2500 i
18.	*Haliaeetus albicilla*	28-33 p (1995-2002)	5-10 i
19.	*Hieraaetus pennatus*	80-120 p (1990-2002)	270-400 i
20.	*Hirundo rustica*	800.000-1.000.000 p (2000-2002)	C
21.	*Pelecanus onocrotalus*	3.500-4.000 p (1990-2002)	2850-3800 i
22.	*Pernis apivorus*	2.000-2.600 p (1990-2002)	3190-7050 i

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23.	*Phylloscopus collybita*	980.000-1.600.000 p (2000-2002)	C
24.	*Sturnus vulgaris*	840.000-1.224.000 p (2000-2002)	C
25.	*Tadorna ferruginea*	20-25 p (1990-2002)	<243 i

Regarding the species observed in passing above the studied area during migration periods (spring, autumn), most of these were determined to be raptors, and, rarely, large water birds. As particularities of the behavioral traits exhibited by these species during the migration period, raptor species most often migrate alone or in small groups, whereas water bird species form larger groups. As such, upon a single observation of the *Ciconia ciconia* species, as many as 40 individuals could be recorded in April 2013. Even so, the risk of collision with the turbines at the Dorobantu-Topolog wind farm is insignificant due to the fact that the flocks pass at heights greater than 400m, and no solitary individuals or groups were observed on the ground at the wind farm site.

Figure 33. Flock of storks above the studied area

Table 25. Estimation of population sizes for species in passage, observed in the studied area (2013) and listed on Standard Data Form of SPA Babadag Forest

No.	Binomial Name	Observed species effectives in the studied area
1	*Accipiter nissus*	a
2	*Buteo buteo*	c
3	*Buteo rufinus*	c
4	*Circus aeruginosus*	b
5	*Circus macrourus*	a
6	*Circus cyaneus*	a
7	*Cyrcus pygargus*	a
8	*Circaetus gallicus*	a
9	*Ciconia ciconia*	d

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10	*Hieraaetus pennatus*	a
13	*Pelecanus onocrotalus*	b
14	*Pernis apivorus*	a

Legend: Intervals:" –" - 0 individuals; **a**: 1-10; **b**: 10-30; **c**: 30-100; **d**: 100-300; **e**: 300-600; **f**:>600

Long-term observations at the wind farm site, informed by data from literature, suggest that the study area can be used as a feeding area by the species classified as migratory by the Standard data Form of SPA Padurea Babadag. Most of the species observed to be feeding or actively searching for food in the area under survey were raptor species.

It is important to point out that some of these species, for example *Hirundo rustica* and *Sturnus vulgaris*, are also nesting or resident species.

Table 26. Assessment of the likelihood that migratory species are present in the studied area based on habitat presence, field observations, and flying activities

Crt. no.	Species SPA Babadag Forest	Feeding habitat (from scientific literature)	Foraging/hunting activities during migration	Migration only
1.	*Accipiter nisus*	forests, scrubs	*	
2.	*Aquila heliaca*	Arable land, pastures		*
3.	*Aquila pomarina*	pastures, arable land	*	
4.	*Buteo buteo*	pasune, arable land	*	
5.	*Ciconia ciconia*	wetlands, pastures, arable land		*
6.	*Circaetus gallicus*	pastures, arable land		*
7.	*Circus aeruginosus*	wetlands, arable land, pastures	*	
8.	*Circus cyaneus*	Arable land, pastures, wetlands	*	
9.	*Circus macrourus*	Arable land, pastures	*	
10.	*Circus pygargus*	pastures, arable land	*	
11.	*Falco vespertinus*	Arable land, pastures	*	
12.	*Hieraaetus pennatus*	pastures, arable land		*
13.	*Hirundo rustica*	Arable land, pastures, inhabited areas		*
14.	*Pelecanus onocrotalus*	wetlands, bodies of water		*

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15.	*Pernis apivorus*	pastures		*
16.	*Sturnus vulgaris*	Arable land, pastures, inhabited areas, forests	*	

Legend: * present; - absent

Table 27. Information on periods of observation and number of observations for the species in the studied area and listed by the Standard Data Form of SPA Babadag Forest

Crt. no.	Species observed during monitoring	Jan 2012	Feb 2012	Mar 2012	Apr 2012	May 2012	Jun 2012	Jul 2012	Aug 2012	Sep 2012	Oct 2012	Nov 2012	Dec 2012
1	*Accipiter nisus*	0	0	0	0	0	0	0	0	0	0	0	0
2	*Anthus campestris*	0	0	0	0	0	0	0	0	0	0	0	0
3	*Aquila heliaca*	0	0	0	0	0	0	0	1	0	0	0	0
4	*Aquila pomarina*	0	0	0	0	0	0	0	0	0	0	0	0
5	*Buteo buteo*	2	2	5	0	4	6	2	10	0	1	1	0
6	*Buteo rufinus*	1	1	1	3	2	0	0	2	1	7	3	0
7	*Calandrella brachydactyla*	0	0	12	33	24	18	52	12	29	8	3	0
8	*Carduelis chloris*	0	0	2	9	6	12	3	7	2	6	3	0
9	*Ciconia ciconia*	0	0	0	0	0	0	0	0	0	0	0	0
10	*Circaetus gallicus*	0	0	0	0	0	0	0	0	0	0	0	0
11	*Circus aeruginosus*	0	0	0	0	0	0	0	0	0	0	0	0
12	*Circus cyaneus*	1	2	1	0	0	0	0	0	0	1	1	2
13	*Circus macrourus*	0	0	0	0	0	0	0	0	0	0	0	0
14	*Circus pygargus*	0	0	0	0	0	0	0	0	0	0	0	0
15	*Coracias garrulus*	0	0	0	0	3	4	5	3	0	0	0	0
16	*Cuculus canorus*	0	0	0	0	0	0	1	2	0	0	0	0
17	*Dendrocopos medius*	3	2	0	4	5	2	0	4	4	2	4	1
18	*Falco vespertinus*	0	0	0	0	0	0	0	0	0	0	0	0
19	*Hieraaetus pennatus*	0	0	0	0	0	0	0	1	0	0	0	0
20	*Hirundo rustica*	0	0	0	14	9	12	26	34	0	0	0	0

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21	*Lanius excubitor*	0	0	0	0	0	0	0	0	0	0	0	0
22	*Lanius collurio*	0	0	0	2	14	34	45	18	0	0	0	0
23	*Lanius minor*	0	0	0	8	27	37	51	30	0	0	0	0
24	*Lullula arborea*	0	0	0	0	0	0	0	0	0	0	0	0
25	*Melanocorypha calandra*	0	0	0	4	17	20	15	14	13	0	0	0
26	*Motacilla alba*	0	0	0	0	0	0	0	0	0	0	0	0
27	*Motacilla flava*	0	0	0	0	0	0	0	0	0	0	0	0
28	*Oenanthe oenanthe*	0	0	0	24	20	45	19	15	7	0	0	0
29	*Oenanthe isabellina*	0	0	0	0	0	0	0	0	0	0	0	0
30	*Pelecanus onocrotalus*	0	0	0	0	0	0	90	50	0	0	0	0
31	*Pernis apivorus*	0	0	0	0	0	0	0	0	0	0	0	0
32	*Saxicola torquata*	0	0	0	0	0	0	0	0	0	0	0	0
33	*Sylvia atricapilla*	0	0	0	0	0	0	0	0	0	0	0	0
34	*Streptopelia turtur*	0	0	0	0	0	0	0	0	0	0	0	0
35	*Sturnus vulgaris*	95	173	56	25	98	94	122	12	78	100	160	200
36	*Upupa epops*	0	0	0	9	28	32	20	4	6	0	0	0

Table 28. Species observed during monitoring

No. co	**Species observed during monitoring**	**Jan 2013**	**Feb 2013**	**Mar 2013**	**Apr 2013**	**May 2013**	**Jun 2013**
1	*Accipiter nisus*	0	0	2	0	0	1
2	*Anthus campestris*	0	0	0	1	1	0
3	*Aquila heliaca*	0	0	0	0	0	0
4	*Aquila pomarina*	0	0	0	10	0	0
5	*Buteo buteo*	1	1	20	2	0	6
6	*Buteo rufinus*	2	0	8	26	27	8
7	*Calandrella brachydactyla*	0	27	0	38	12	0
8	*Carduelis chloris*	0	0	0	0	0	0

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9	*Ciconia ciconia*	0	0	21	116	0	0
10	*Circaetus gallicus*	0	0	0	1	4	0
11	*Circus aeruginosus*	0	0	4	6	6	2
12	*Circus cyaneus*	2	3	4	6	0	0
13	*Circus macrourus*	0	0	1	1	0	0
14	*Circus pygargus*	0	0	0	6	2	0
15	*Coracias garrulus*	0	0	0	0	0	0
16	*Cuculus canorus*	0	0	0	0	1	0
17	*Dendrocopos medius*	3	1	0	0	0	0
18	*Falco vespertinus*	0	0	0	6	6	0
19	*Hieraaetus pennatus*	0	0	1	12	21	4
20	*Hirundo rustica*	0	0	0	1	8	0
21	*Lanius excubitor*	0	2	0	0	0	0
22	*Lanius collurio*	0	0	0	0	6	0
23	*Lanius minor*	0	2	0	0	2	0
24	*Lullula arborea*	0	0	0	3	11	16
25	*Melanocorypha calandra*	0	36	0	29	14	0
26	*Motacilla alba*	0	0	0	2	0	0
27	*Motacilla flava*	0	0	0	1	2	0
28	*Oenanthe oenanthe*	0	0	0	5	14	0
29	*Oenanthe isabellina*	0	0	0	6	0	0
30	*Pelecanus onocrotalus*	0	0	0	15	0	0
31	*Pernis apivorus*	0	0	0	2	0	0
32	*Saxicola torquata*	0	0	0	1	0	0
33	*Sylvia atricapilla*	0	0	0	2	0	0
34	*Streptopelia turtur*	0	0	0	0	5	0
35	*Sturnus vulgaris*	14	132	0	6	274	0

36	*Upupa epops*	0	0	0	1	1	0

5.1.2. Species of concern at the national level

This section provides an overview of the species of interest for preservation at the national level (Species included within the NATURA2000 Sites lists, not including those species already treated in Section 5.1.1.), observed, or potentially present within the studied area, identified as target species within the study framework.

A characterization of the species, based on data from literature, can be found in Appendix [4].

Table 29. An estimation for the bird species populations in Romania:

No.	Binomial Name	Estimated population in Romania (pairs or individuals/years)*
1.	*Carduelis cannabina*	780.000 – 1.100.000 p (1999–2002)
2.	*Carduelis carduelis*	887.000 – 964.000 p (1999–2002)
3.	*Carduelis chloris*	850.000-910.000 p (1999-2002)
4.	*Erithacus rubecula*	1.854.000 – 2.670.000 p (2000-2002)
5.	*Falco tinnunculus*	10.000 – 14.000 p (1990-2002)
6.	*Sitta europaea*	480.000 – 660.000 p (2000-2002)
7.	*Miliaria calandra*	940.000 – 1.200.000 p (2000-2002)
8.	*Otus scops*	25.000 - 40.000 p (1990-2002)
9.	*Merops apiaster*	15.000 – 20.000 p (2000-2002)

In order to estimate population sizes for the species listed under Annex 4B of GEO 57/2007 within the studied area and at the Dorobantu-Topolog wind farm site, the numbers were fitted into 7 intervals, as follows: 0 individuals; **a**: 1-10; **b**: 10-30; **c**: 30-100; **d**: 100-300; **e**: 300-600; **f**:>600.

Table: Population size estimation for species observed in the studied area and listed by Annex 4B of GEO 57/2007.

Table 30. Effectives of species observed in the studied area

Crt. No.	Binomial Name	Effectives of species observed in the studied area	Phenology
1.	*Carduelis cannabina*	c	resident/ breeding
2.	*Carduelis carduelis*	c	resident/ breeding
3.	*Carduelis chloris*	c	resident/breeding
4.	*Erithacus rubecula*	a	resident/breeding
5.	*Falco tinnunculus*	c	resident/breeding
6.	*Sitta europaea*	a	resident/breeding
7.	*Miliaria calandra*	d	resident/ breeding
8.	*Otus scops*	a	migrant/breeding
9.	*Merops apiaster*	b	breeding

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As can be seen in the table above, population sizes in the area under survey are small compared to the numbers estimated at the national level. An important aspect to point out is however that given the diversity of habitats identified within the studied area, all the species listed can be considered as breeding in the area.

Table 31. Estimation population sizes for species observed within the wind farm boundaries and listed by Annex 4B of GEO 57/2007

Crt. no.	Binomial Name	Effectives approximation for species observed	Phenology
1	*Carduelis cannabina*	b	resident
2	*Carduelis carduelis*	b	resident
3	*Carduelis chloris*	b	resident
4	*Merops apiaster*	a	not breeding
5	*Miliaria calandra*	c	resident/ breeding

Of the 9 species observed in the studied area and listed by Annex 4B of GEO 57/2007, 4 are to be found at the site of the Dorobantu-Topolog wind farm. Unlike the studied area as a whole, solely 3 types of habitats exist at the wind farm site, namely: pastures, arable land and limited areas of shrubbery, in turn exposed to the impact of the human factor. As such, the likelihood that these species nest within the windfarm perimeter is very small.

In what follows, the likelihood that some species of concern at the national level be present in the studied area was assessed based on the presence of characteristic habitats / vegetation. The table below shows that nesting habitats similar to those described in literature as characteristic are found for solely 9 species (out of a total of 23) at the wind farm site. Even so, within the studied area as a whole nesting habitats for 20 species were observed.

Through analyzing the presence of feeding habitats, it can be inferred that 22 of the 23 species can come down to the studied area for feeding purposes, 19 of which may reach the wind farm site as well.

We point out that the *Panurus biarmicus* species was not observed within the studied area throughout the monitoring period. Habitats suitable for this species are wetlands with reed thickets, which were not present within the studied perimeter. However, the species was considered a target species already at the beginning of the monitoring, regarding the possibility that it crosses through the wind farm site during the migration period.

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Table 32. Assessment of the likelihood that the species of concern at national level be present in the studied area results based on the presence of characteristic habitat / vegetation

Crt. no.	Species GEO 57/2007 potentially in SPA	Nesting habitat	Feeding habitat	Habitats present on site		Habitats present in the studied area	
				Nesting habitat	Feeding habitat	Nesting habitat	Feeding habitat
1.	*Carduelis chloris*	pastures, scrubs, forest edges	forest edges	*	*	*	*
2.	*Aegithalus caudatus*	forests	forests	-	-	*	*
3.	*Athene noctua*	forests, steep banks, stony places	pastures, arable land	-	*	*	*
4.	*Carduelis cannabina*	urban areas, scrubs, forest edges	pastures	*	*	*	*
5.	*Carduelis carduelis*	scrubs, woodland	Arable land, pastures	*	*	*	*
6.	*Carduelis flammea*	forests, scrubs	pastures	*	*	*	*
7.	*Carduelis spinus*	forests (1330m alt)	pastures	-	*	-	*
8.	*Coccothraustes coccothraustes*	forests (*Quercus, Carpinus, Acer*), arable land with scrubs	forests (*Quercus,Carpinus, Acer*), arable land withscrubs	*	*	*	*
9.	*Corvus corax*	highlandsforests, rocklets	pastures, arable land, wetland, inhabited areas	-	*	-	*
10.	*Erithacus rubecula*	forests, scrubs	pastures	*	*	*	*
11.	*Falco subbuteo*	uses nests of crows	pastures, arable land	-	*	*	*
12.	*Falco tinnunculus*	stony places, high sides, nests of crows, inhabited areas	pastures, arable land	-	*	*	*
13.	*Jynx torquilla*	forestedges, tall trees	pastures	-	*	*	*
14.	*Merops apiaster*	waterbanks, loess banks	pastures, arable land, scrubs	-	*	*	*
15.	*Miliaria calandra*	pastures, scrubs	pastures, arable land	*	*	*	*
16.	*Panurus biarmicus*	wetland	Wetlands	-	-	-	-
17.	*Otus scops*	forests	pastures, arable land	-	*	*	*
18.	*Passer hispaniolensis*	Forest edges, inhabited areas	pastures, forests edges,inhabited areas	-	*	*	*
19.	*Phoenicurus ochruros*	stony areas, scrubs, inhabited areas	scrubs, pastures	*	*	*	*
20.	*Picus viridis*	forests	forests	-	-	*	*
21.	*Sitta europaea*	forests	forests	-	-	*	*
22.	*Sturnus roseus*	pastures, arable, rock quarries, inhabited area	pastures, arable land	*	*	*	*
23.	*Tyto alba*	inhabited area	Arable land, pastures	-	*	*	*

Legend: * present; - absent.

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Table 33. Information regarding the periods of observation and number of observations for the species listed under Annex 4B of GEO 57/2007 in the studied area.

Crt. no.	1	2	3	4	5	6	7	8	9
Binomial name	*Carduelis cannabina*	*Carduelis carduelis*	*Carduelis chloris*	*Erithacus rubecula*	*Falco tinnunculus*	*Merops apiaster*	*Miliaria calandra*	*Otus scops*	*Sitta europaea*
Jn. 2012	0	34	0	0	0	0	0	0	0
Feb. 2012	8	45	0	0	3	0	0	0	0
Mar. 2012	0	22	2	0	5	0	10	0	0
Apr. 2012	12	16	9	0	2	4	14	0	0
May. 2012	4	9	6	0	10	15	6	0	0
Jun. 2012	24	18	12	0	3	38	12	0	0
Jul. 2012	2	8	3	0	8	22	22	0	0
Aug. 2012	28	6	7	0	1	19	14	0	0
Sep. 2012	35	2	2	0	4	0	2	0	0
Oct. 2012	2	9	6	0	2	0	8	0	0
Nov. 2012	8	14	3	0	0	0	0	0	0
Dec. 2012	0	7	0	0	0	0	0	0	0
Jn. 2013	0	34	0	0	1	0	0	0	0
Feb. 2013	0	17	0	0	1	0	0	0	0
Mar. 2013	0	0	0	0	9	0	0	0	0
Apr. 2013	0	0	0	2	37	0	143	0	1
May 2013	0	0	0	0	38	13	77	1	0
Jun. 2013	0	0	0	0	12	0	0	0	0

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5.1.3. Migratory species of concern

This section provides an overview regarding the species of preservation concern, listed under Law no.13/1998 by which the Bonn Convention is enforced in Romania, potentially present along the Pontica flyroute and identified within the study framework as target species. The characterization of the species, based on information from literature, can be found in Appendix[5].

Table 34. Species Act no.13/1998 that occur in Romania

Species Act no.13/1998 that occur in Romania	Presence potential on Pontica flyroute
Pelecanus crispus	*
Pelecanus onocrotalus	*
Geronticus eremita	
Oxyura leucocephala	
Haliaeetus albicilla	*
Grus leucogeranus	
Otis tarda	
Numenius borealis	
Numenius tenuirostris	
Larus audouinii	
Larus leucophthalmus	

An estimation of the population size, in Romania, for the bird species potentially present along the Pontica flyroute and listed under Annex1 of Law No. 13/1998 is given in the table below.

Table 35. Estimated population in Romania (pairs or individuals/years) for the bird species potentially present along the Pontica flyroute

Crt. No.	Binomial Name	Estimated population in Romania (pairs or individuals/years)
1.	*Pelecanus onocrotalus*	3.500-4.000 p (1990-2002)
2.	*Pelecanus crispus*	20-50 p (1900-2000).
3.	*Haliaeetus albicilla*	28-33 p (1995-2002)

Table 36. Assessment of the presence potential for species on the Pontyca flyroute and listed under Annex 1 of Law No.13/1998 within the studied area,based on the presence of characteristic habitat/ vegetation.

Crt. no.	Bonn Convention Species	Nesting habitat	Feeding habitat	Habitat present on site		Habitat present in the studied area	
				Nesting	Feeding	Nesting	Feeding
1.	*Pelecanus onocrotalus*	wetland	wetland	-	-	-	-
2.	*Pelecanus crispus*	wetland	wetland	-	-	-	-
3.	*Haliaeetus albicilla*	Forest,wetland	wetland, arable land	-	*	-	*

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All three species are specific to wetlands and were not observed nesting or feeding at the wind farm site. As was pointed out in previous sections (**4.1.2.3. Comments on the monitoring plan**), the *Haliaetus albicilla* species is very unlikely to reach the wind farm area for feeding purposes, given the ecological characteristics for this species. Individuals of the *Pelecanus* Genus can fly across the studied area at high altitudes (>500 m), taking advantage of the ascending currents formed above the Babadag Plateau.

Information on trends and changing habitats

The habitats present within the area under survey, which were elaborated on in Chapter 2.2.4. ***The main types of habitats***, are currently exposed to intense anthropogenic pressures, consisting of agricultural activities (grazing and agricultural cultures); hunting, but also poaching – given that the Babadag forest shelters a rich fauna of hunting interest; illegal cut down of trees, traffic, human habitation, illegal gathering of the species of flora and fauna of conservative interest in the protected natural areas.

The land areas at the site currently covered in pastures are largely included in the North Dobrogea Plateau Site of Community Importance, the preservation objectives of which being the habitats as well as the flora and fauna protected at the European level. Although the site was declared a protected natural area of communitarian interest already in 2007, at the present moment (2013) there exists no management plan to regulate the types of activity carried out within its boundaries. As such, agricultural activities (grazing, the use of pesticides, insecticides and chemical fertilizers, the introduction of agricultural cultures non-indigenous of the area, gathering medicinal herbs) that have an impact on biodiversity continue to be carried out unrestricted, and without any measures meant to preserve the habitats. The impact is particularly great on steppic grassland areas, used by the locals as pastures. As a consequence of unrestricted grazing, the primary vegetation was replaced by secondary steppic vegetation, which is more resistant to grazing. The main effects on the carpet of vegetation stemming from grazing are as follows: the spread of allochthonous species, soil compaction, the intensification of the erosion processes, damaging protected flora species, stimulating nitrophilic species. Many characteristic and endemic species are nowadays rare or have disappeared completely, and a number of continental steppic species with a wide phyto-geographical spread has developed in their place. The most important effect is the alteration of the coenotic composition, with consequences upon the entire ecosystem, including upon the animal species associated with steppic habitats.

As can be observed in the schematic representation below (adapted after Ev.Puscaru-Soroceanu, I. Tucra, 1959) the vegetation at the site finds itself in the second stage of

phytocenoses degradation as a result of excessive grazing. This stage is characterized by the prevalence of grazing-resistant species (*Botriochloa ischaemum, Eryngium campestre, Ceratocarpus arenarius*), compaction-resistant species (*Poa bulbosa* and *Artemisia austriaca*), and nitrophilic species (*Xanthium spinosum, Carduus thoermeri, Carduus acanthoides, Lotus corniculatus*).

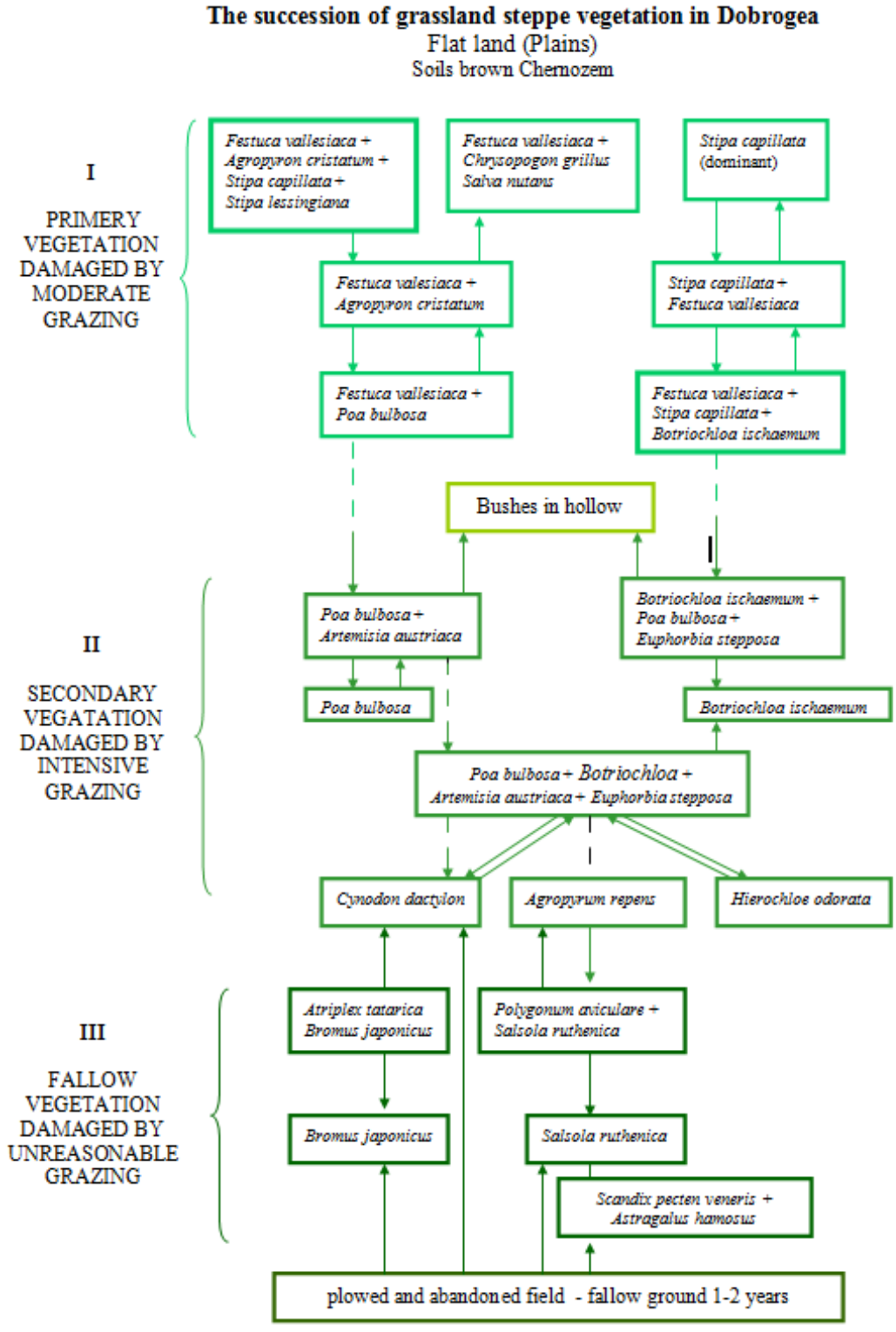

Figure 34. The succession of grassland steppe vegetation in Dobrogea

Figure 35. Chemical fertilizers used on pastures

Figure 36. Images of grazing in the surveyed area

Excessive grazing, carried out all year round, has negative effects on the populations of nesting species. As such, the human element and the presence of economically profitable livestock and of shepherd dogs are a disruptive factor for nesting bird species. In addition, the changes in the vegetation structure determine changes in land preferences for different bird species; thus, *Perdix perdix* and *Phasianus colchicus* have a preference for areas with tall grasses (found around the forest areas) as shelter, while small-size insectivorous species prefer areas covered in short steppic vegetation (prevalent around localities), which offer greater visibility and facilitate hunting. A further aspect observed at the wind farm site was the presence in large numbers of *Upupa epops* individuals, which are attracted by coprophagous insects. These insects develop in the fecal matter from the animals grazing in the area.

On the other hand, grazing, which in many cases causes the development of short vegetation, creates favorable habitats for the *Spermophilus citellus* species, which is a source of food for diurnal raptor species.

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5.1.4. General considerations on the structure of the bird community

This section offers the complete list of bird species observed in the field, as well as a series of comments regarding the structure of the avifauna within the studied area. The Annex attached to the report further includes the synthetic tables for the field observations carried out between 2006 and 2013.

Table 37. All bird species observed in the studied area

Crt. No.	Binomial Name	Crt. No.	Binomial Name
1	*Accipiter gentilis*	37	*Hieraaetus pennatus*
2	*Accipiter nisus*	38	*Hirundo rustica*
3	*Alauda arvensis*	39	*Lanius excubitor*
4	*Anthus campestris*	40	*Lanius collurio*
5	*Aquila heliaca*	41	*Lanius minor*
6	*Aquila pomarina*	42	*Lullula arborea*
7	*Ardea cinerea*	43	*Melanocorypha calandra*
8	*Asio flammeus*	44	*Merops apiaster*
9	*Athene noctua*	45	*Miliaria calandra*
10	*Buteo buteo*	46	*Motacilla alba*
11	*Buteo lagopus*	47	*Motacilla flava*
12	*Buteo rufinus*	48	*Oenanthe oenanthe*
13	*Calandrella brachydactyla*	49	*Oenanthe isabellina*
14	*Carduelis cannabina*	50	*Oriolus oriolus*
15	*Carduelis carduelis*	51	*Otus scops*
16	*Carduelis chloris*	52	*Pandion haliaetus*
17	*Ciconia ciconia*	53	*Passer domesticus*
18	*Circaetus gallicus*	54	*Passer montanus*
19	*Circus aeruginosus*	55	*Pelecanus onocrotalus*
20	*Circus cyaneus*	56	*Perdix perdix*
21	*Circus macrourus*	57	*Pernis apivorus*
22	*Circus pygargus*	58	*Phalacrocorax carbo*
23	*Coracias garrulus*	59	*Phasianus colchicus*
24	*Corvus cornix*	60	*Pica pica*
25	*Corvus frugilegus*	61	*Riparia riparia*
26	*Corvus monedula*	62	*Saxicola torquata*
27	*Cuculus canorus*	63	*Sitta europaea*
28	*Dendrocopos major*	64	*Sylvia atricapilla*
29	*Dendrocopos medius*	65	*Streptopelia decaocto*
30	*Erithacus rubecula*	66	*Streptopelia turtur*
31	*Falco tinnunculus*	67	*Strix aluco*
32	*Falco vespertinus*	68	*Sturnus vulgaris*
33	*Ficedula parva*	69	*Turdus philomelos*
34	*Fringilla coelebs*	70	*Turdus merula*
35	*Galerida cristata*	71	*Upupa epops*
36	*Garrulus glandarius*		

The diversity of the fauna is strongly correlated to the diversity of the habitats in the studied area. Given that agroecosystems are predominant, the area is populated mainly by characteristic species, featuring specific adaptations.

It was observed that most species identified on site prefer open areas and have a high level of adaptability vis-à-vis anthropic activities.

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Bird species are the most numerous group of vertebrates present within the studied area. Based on their affinity to certain types of habitat, bird species can be classified along the following ecological categories:

- Species which prefer arborous vegetation (wooded areas and orchards) as a feeding, sheltering and breeding habitat, such as *Dendrocopus major* and *Dendrocopus medius*.
- Species nesting in forested areas, but reaching agricultural land and pastures in search for food, Characteristic of this group are raptor species, diurnal and nocturnal, as well as many Passeriformes.
- Small insectivorous and granivorous species, having a preference for open fields, dominated by herbaceous vegetation, as feeding and breeding habitats, such as *Oenanthe oenanthe, Anthus campestris, Alauda arvensis, Callandrella brachydactyla, Melanocorypha calandra.*
- Species which prefer shrubbery as shelter and breeding habitat, but open fields for feeding habitat, such as: *Lanius collurio, Lanius minor, Carduelis carduelis, Miliaria calandra, Emberiza citrinella.*
- Usually insectivorous species nesting along loess ravines: *Coracias garrulus, Hirundo rustica* and *Merops apiaster*.
- Synanthropic species, characteristic of inhabited areas, typically exhibiting high levels of adaptability to the anthropic factor, such that the population size of these species is the largest one within the studied area. Among these, *Corvus frugilegus, Corvus cornix, Corvus monedula, Hirundo rustica, Passer domesticus,Passer montanus, Sturnus vulgaris, Streptopelia decaocto* are noteworthy.

Throughout the monitoring period (January 2012-June 2013), some fluctuations in the population size for the bird species observed in the studied area were witnessed, largely determined by the seasonal climatological variations. As such, during the winter season, the sedentary bird population was supplemented by individuals coming from northern areas, those same individuals taking the same routes back at the onset of spring. For representatives of the *Laniidae, Hirundinidae, Motacillidae, Coraciidae, Meropidae, Accipitridae* and *Falconidae* families, the population size begins to decline at the end of the summer season, followed by a natural increase at the beginning of spring.

From the first observations carried out in the area for the purpose of elaborating environmental studies, and up to the present, no major changes in the bird population structure were recorded on site, with the area retaining the same environmental conditions, andcontinuing to be impacted by human factor. Since the arable lands in the area are being maintained through

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agricultural works specific to the type of culture and its vegetation period, they do not represent optimal nesting habitats, but can offer shelter to juvenile and mature individuals. Thus, juvenile individuals of the *Anthus campestris* and *Oenanthe oenanthe* species were recorded in arable lands across the area. The plane areas within the pastures do not offer favorable shelter conditions for species nesting at ground level. This aspect is of added importance, since a heavy presence or predator species, such as *Vulpes vulpes, Mustela eversmanii, Martes foina, Canis aureus* and *Meles meles*, was observed in the area.

Figure 37. *Canis aureus*

Figure 38. *Entrance into a marten burrow*

The Passeriformes order is the most well-represented order in the area and the environs, surpassing all other orders in terms of both the number of species present and the number of individuals.

Natural habitat degradation and their replacement with anthropic habitats has led, in time, to a decrease in the number of ecological niches and an intensification of interspecific competition, with the flexible nutritional demands and elevated level of adaptability being a clear advantage for synanthropic species vis-à-vis other elements of the avifauna.

Anthropophilic species, such as *Passer domesticus, Passer montanus, Sturnus vulgaris, Corvus monedula, Corvus frugilegus, Corvus cornix, Pica pica,* were observed to dominate the avifauna in the studied area.

Corvidae are usually omnivorous species, exhibiting a complex social behavior. They are opportunistic species, adapted to several types of habitat. These are a constant presence within the analyzed area, both on the arable land and in trees along the roads.

A further well-represented bird family on site is the *Alaudidae* family, formed of small- or medium-sized songbirds, with uniformly colored feathers, building their nests on the ground; they can be migratory, partially migratory or sedentary species. The crested lark was observed on the side of roads or in the fields, flying in small flocks in wintertime. *Calandrella brachydactyla*, *Melanocorypha calandra* and *Alauda arvensis* individuals constantly reach the wind farm site,

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and were observed to have a preference for open areas, pastures and fields cultivated with grain. A particularity for larks building nests at ground level is the earthy coloring of their plumage, which helps them camouflage and blend in chromatically with the environment, making them difficult to notice. In springtime, larks exhibit nuptial behaviors; on sunny days, they can be heard singing and observed while performing their characteristic flight pattern, namely a slow ascent, followed by soaring and an abrupt descent.

Sparrows and sand martins were observed generally in flocks, hunting for insects in flight. The sparrows' habitat is close to human settlements, where they nest, whereas sand martins live in colonies and nest on loess walls in ravines.

Abrupt loess walls, taking shape as a result of erosion, were observed within the perimeter under survey. These walls are often home to nest belonging to the *Merops apiaster* and *Coracias garrulous* species. Most of the time, these nesting areas are situated along river valleys, on ground permanently exposed to erosion, presenting an elevated geotechnical risk, and as such unsuitable for installing wind turbines.

Emberizidae are predominantly granivorous bird species, which have a preference for open areas with small shrubs and agricultural lands. Individuals pertaining to the two species that were identified, *Miliaria calandra* and *Emberiza citrinella* were mainly observed in area with herbaceous steppic vegetation and scrubs (*Crataegus monogyna*). In August and September, a period which coincides with that of the maturation of the sunflower head, numerous buntings were identified on cultivated plots of land on the wind farm site.

The *Fringillidae* are one of the families richest in number of species of all Passeriformes. They are generally small- and medium-sized arboreal birds, but can easily move around on the ground as well. *Fringillidae* species usually nest in scrubs along the side of the road, in ecotonal areas of crossing between forested and steppe areas, and in arable lands.

The *Laniidae* family is well represented in the area, mainly due to the presence of grasslands with scrub vegetation, which serve as both shelter and feeding habitat. Representatives of this family are species mainly feeding on large insects but also small vertebrates such as lizards, mice, but also birds. Two such species are usually encountered during the vernal and aestival seasons, the *Lanius minor*, *Lanius collurio*, and accidentally *Lanius excubitor* individuals, which are normally guests during winter. Even if the 2012 season fieldwork records feature numerous sightings of *Lanius excubitor*, their number is certainly smaller, the difference stemming most likely from the similarities between *Lanius minor* and *Lanius excubitor*.

The *Motacillidae* family is composed of small-sized insectivorous species, which have a preference for grasslands and arable land. *Anthus campestris* prefers land covered in short

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vegetation, and nests on the ground, in shallow cavities or hollows, often underneath clumps of vegetation. *Motacilla alba* is an anthropophiliac species, having a preference for nesting in the vicinity of, or within, human settlements. On the wind farm site, both *Motacilla alba* and *Motacilla flava* individuals can be observed in the months of May and April.

Diurnal raptors were observed in flying over large areas, particularly soaring in active search for prey, or in passing during the migration period.

At the same time, the presence of nocturnal raptor species (for example, *Asio flammeus*), was recorded during nighttime monitoring sessions, particularly in the area of the Babadag forest, but also around the forest edges.

Knowing the activity of the raptor species considered to be resident in the studied area (according to the observations from the research from the period 2006 - 2013) was one of the main interests of the team of experts which conducted the inventory and monitoring. This aspect was considered important due to the potential interactions between large raptors permanently present in the area and moving elements of wind turbines.

The data from the centralization of the observations collected mostly in the last year of study (2012 - 2013) has resulted in analyzes which (among others) were the basis for the maps presented next. This form of presentation of the results was considered appropriate, as it can clearly track the position of resident diurnal raptor species sightings, both in relation to the Vantage Points, and especially with the projected locations of the wind turbines.

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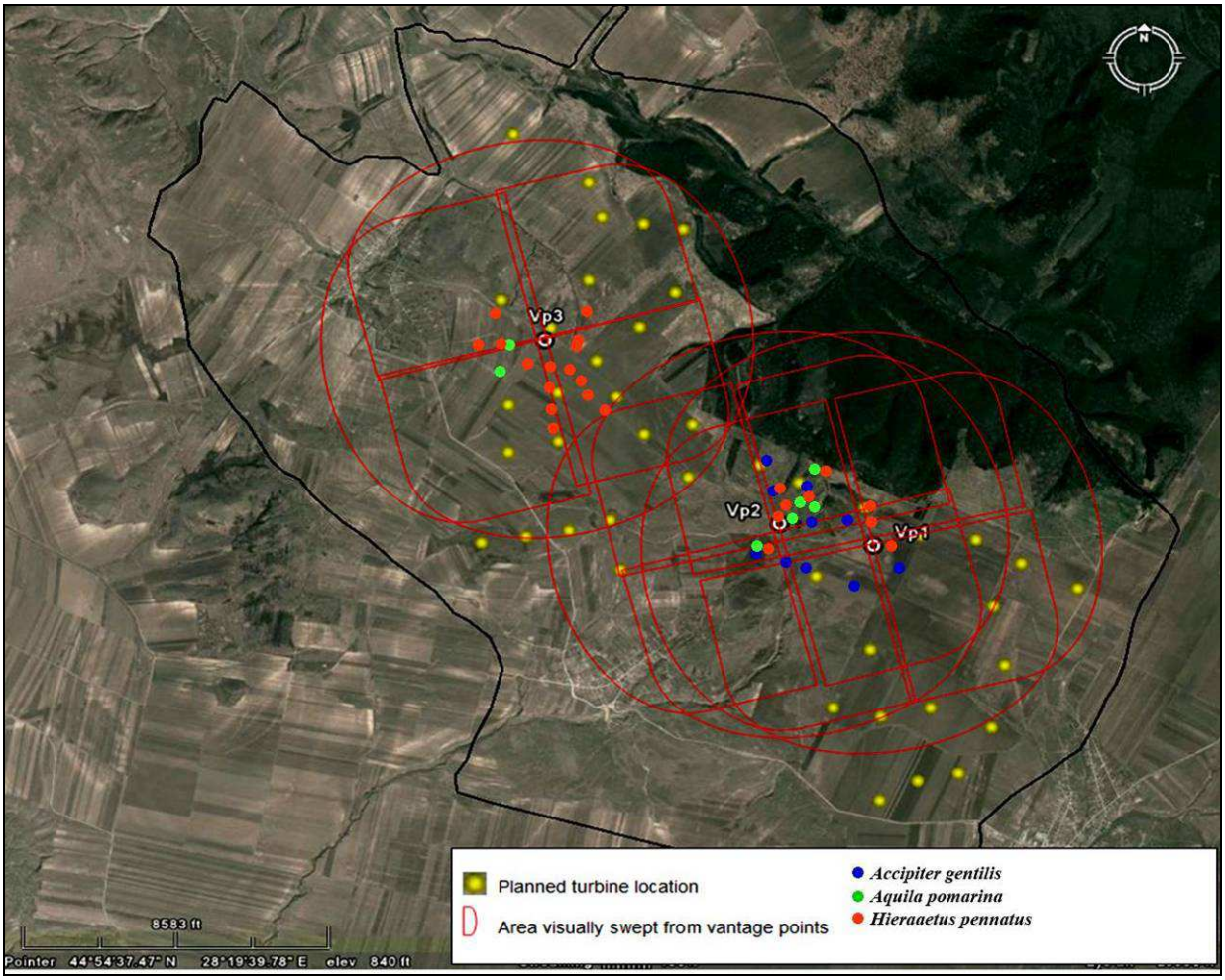

Figure 39. Flight activity of *Accipiter gentilis* (no. of observations = 10), *Aquila pomarina* (no. of observations = 9) and *Hieraaetus pennatus* (no. of observations = 39), during the entire obsevation time

The species were grouped by three, so as not to generate too busy graphical representations, for the ease of tracking the observations.

Therefore, the activity of the species *Accipiter gentilis, Aquila pomarina* and *Hieraaetus pennatus* is presented in figure 39. These three species recorded activity over the entire duration of the observations program, which led to the conclusion that there potentially are nesting specimens area, but there certainly are resident specimens.

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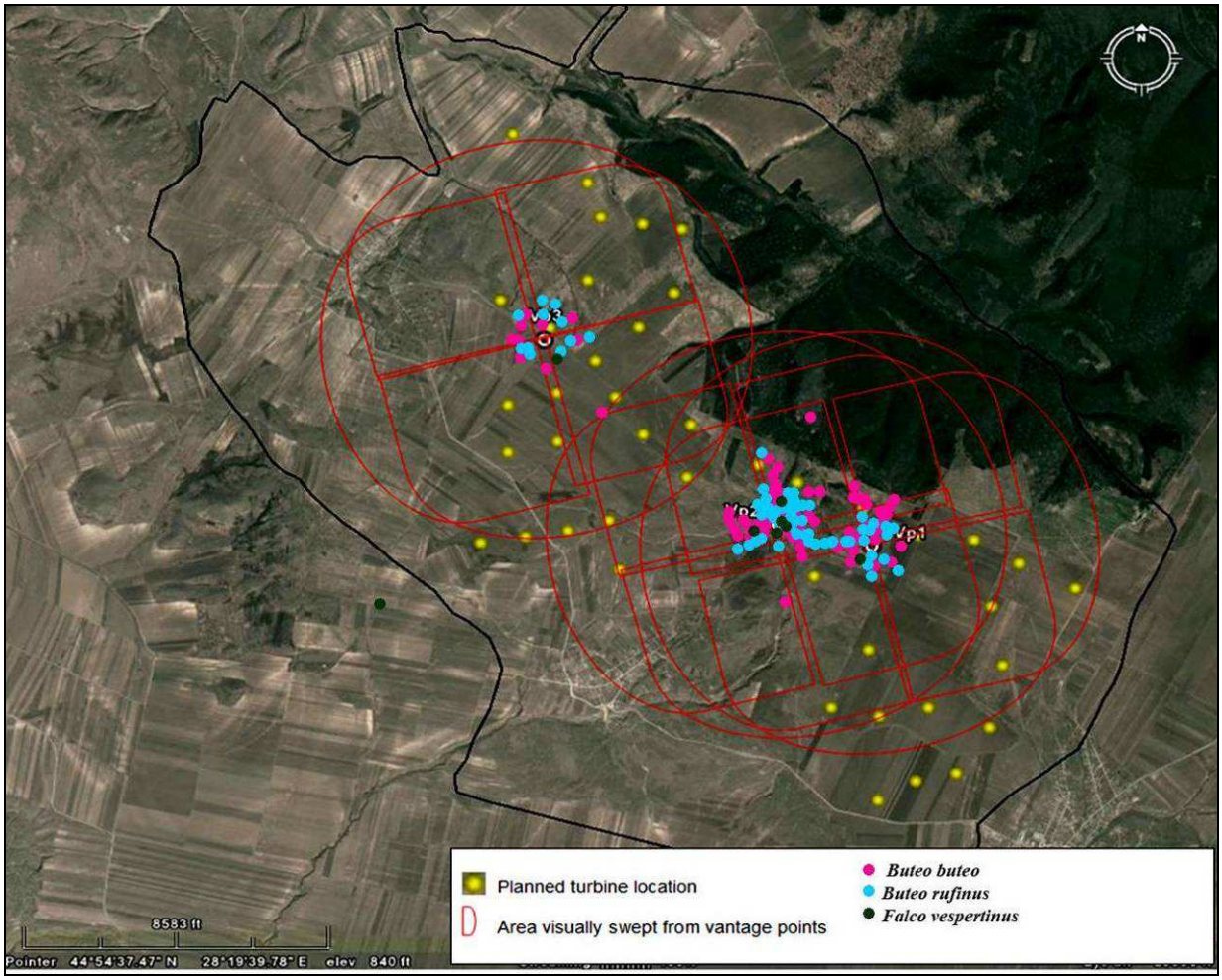

Figure 40. Flight activity of *Buteo buteo* (no. of observations = 85), *Buteo rufinus* (no. of observations = 84) and *Falco vespertinus* (no. of observations = 12), during the entire obsevation time

The activity of the *Buteo buteo, Buteo rufinus* and *Falco vespertinus* species is presented in figure 40. As in previous cases, these species have recorded activity in the area over the entire duration of the program of observations, which led to the conclusion that there are potentially nesting specimens in the area, but there certainly are resident ones.

A relatively small number of specimens Falco vespertinus were seen, and observations were made mostly in spring 2013 (previously, the species was not observed in the area).

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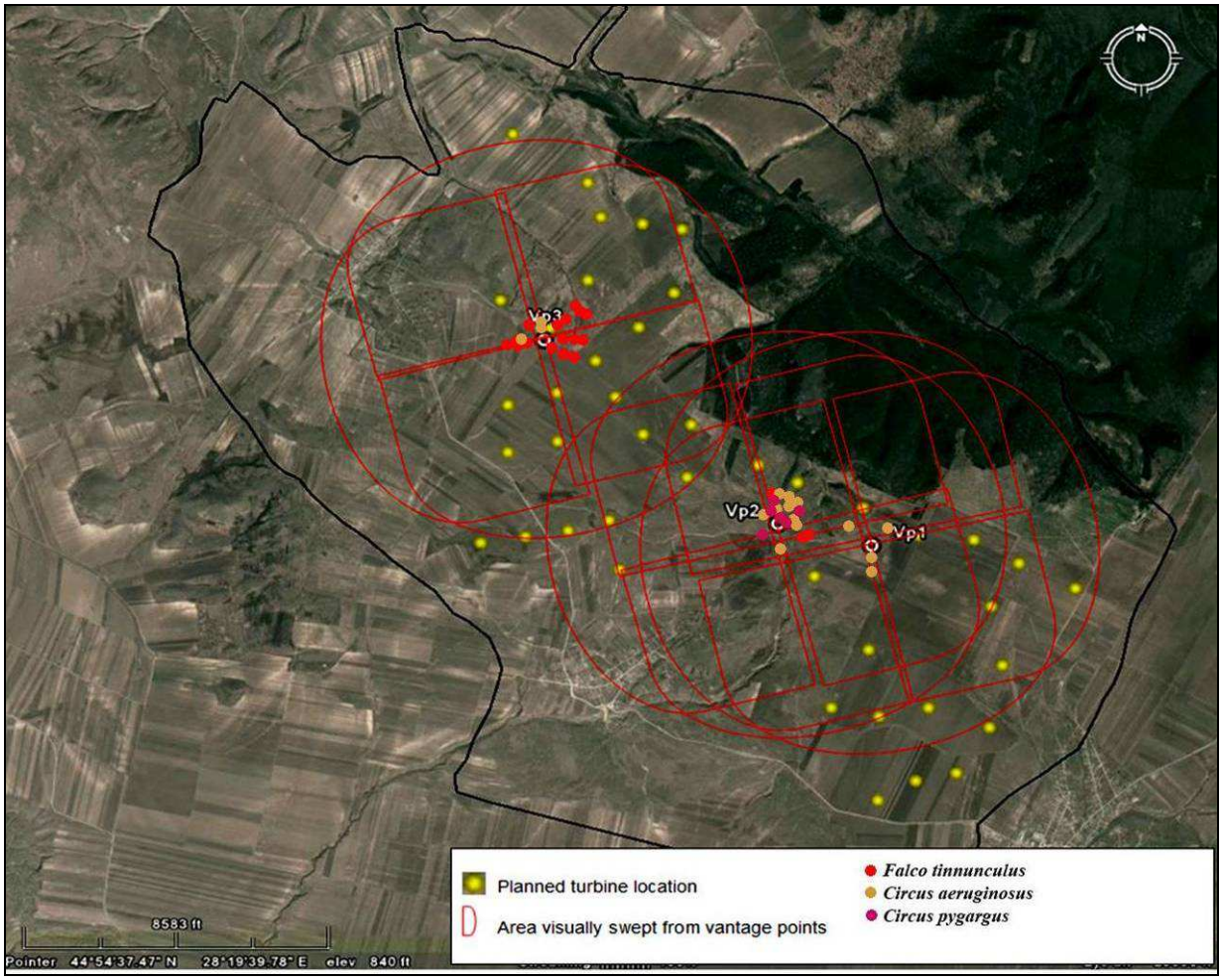

Figure 41. Flight activity of *Falco tinnunculus* (no. of observations = 22), *Circus aeruginosus* (no. of observations = 17) and *Circus pygargus* (no. of observations = 6), during the entire obsevation time

In figure 41, the activity of *Falco tinnunculus*, *Circus aeruginosus* and *Circus pygargus* species is illustrated. Most of these bird flight recordings were made during 2012 - 2013, with the intensification of the inventory and observation efforts. The conclusions resulted regarding the species mentioned above accredits their presence in this area as resident species. The number of observations and their distribution suggests the presence of the species in the central and Northern part of the wind farm (this was one of the reasons for grouping the observations regarding the species presented, on the same map).

In all cases of the nine species of diurnal raptors considered residents in the area, it is necessary to continue observations for the future periods of the construction of the wind farm, and especially after it comes into operation. Any change in the behavior of the species observed should particularly be followed, once all elements of the wind farm begin operation.

We mention that we generically called "resting season" the period between August 1st and August 30th and November 1st and December 1st . In the first stage (that from late summer),

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nesting birds have finished raising the young and, along with them, they change plumage either in view of the migration, or of the dispersal in territory.

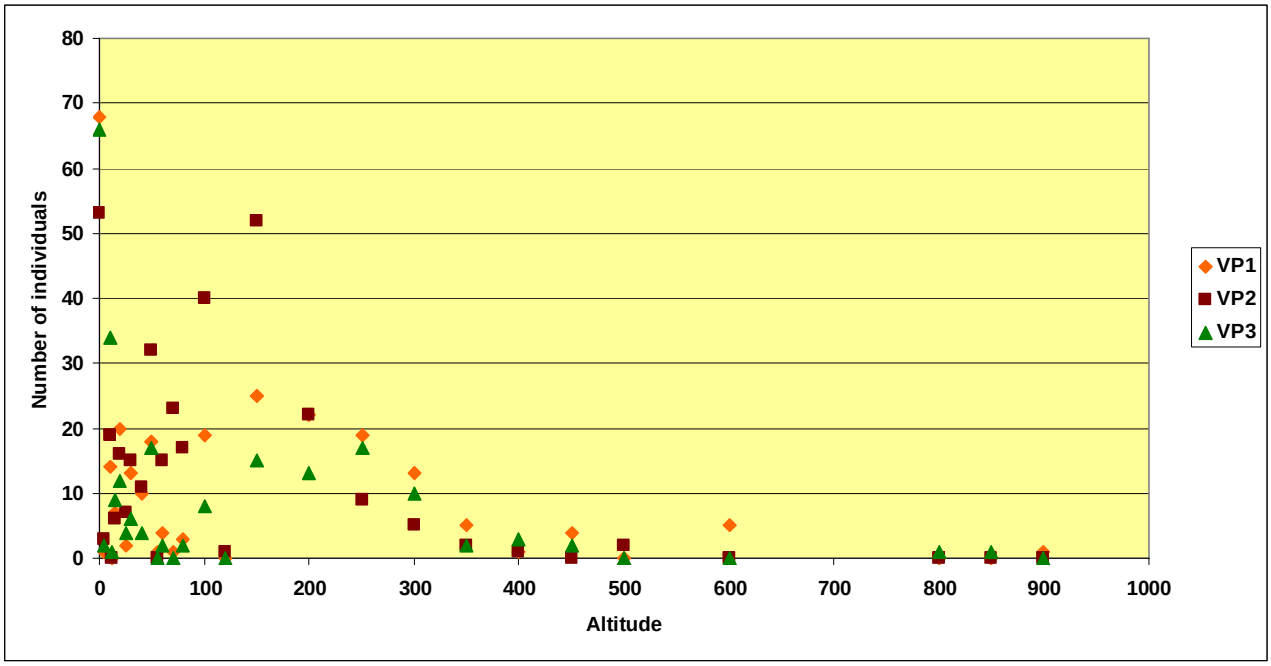

Figure 42. The flight altitude of birds during 2012 - 2013 Vantage Points observation

The analysis of flight altitudes of birds for the study period between January 2012 and June 2013 highlights that most of them move at altitudes between 25 and 150 meters (632 observations), while only 39 observations were at altitudes above 200 meters. In over 180 cases, the birds were observed on the ground, either feeding or stationary (figure 42).

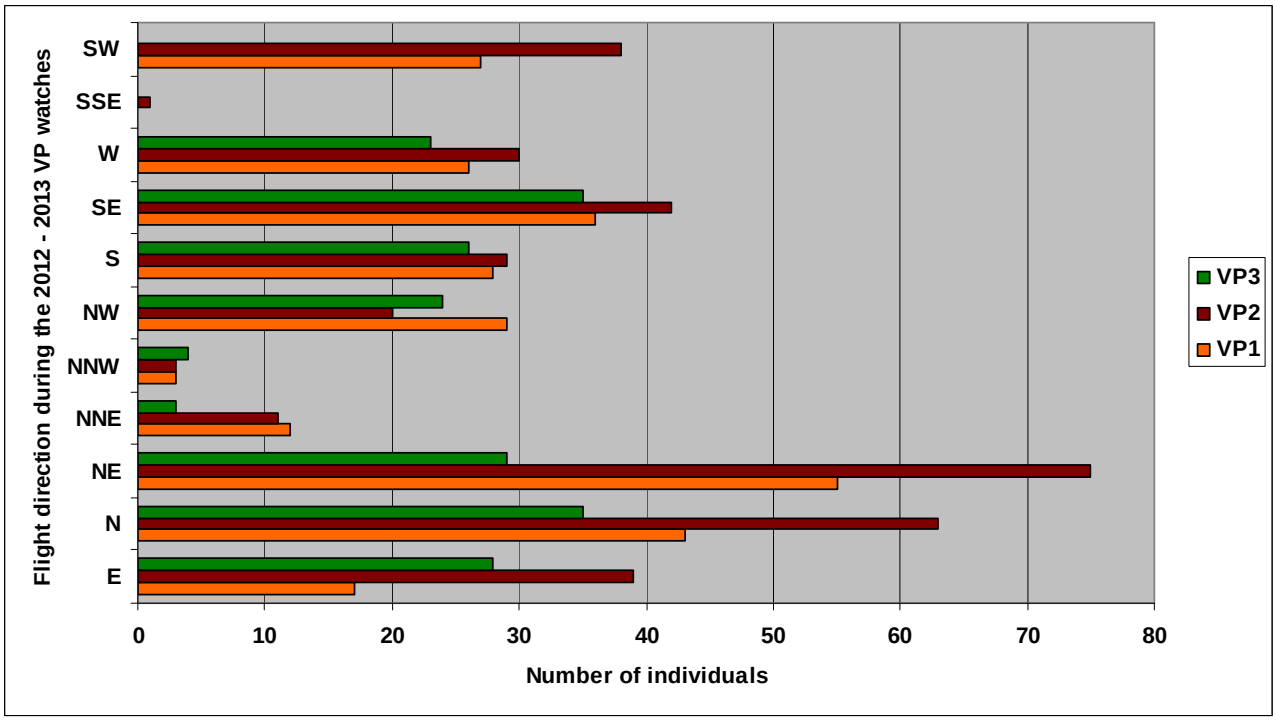

Figure 43. Main flight direction of birds during 2012 - 2013 Vantage Points observation

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In terms of the observations regarding the main directions of flight that the bird movements were registered on during the study period 2012 - 2013 (figure. 43), it is found that most observations caught birds moving on the NE (160 flights) and the North (141 flights) direction, while 113 flights were observed on the SE direction. The directions on which the fewest flights were recorded were the SSE (1) and NNW (10). All other flight directions recorded between 11 and 100 flights.

In terms of the number of observations reported to the Vantage Point position, it is found that most observations were made from VP2 (351 observations).

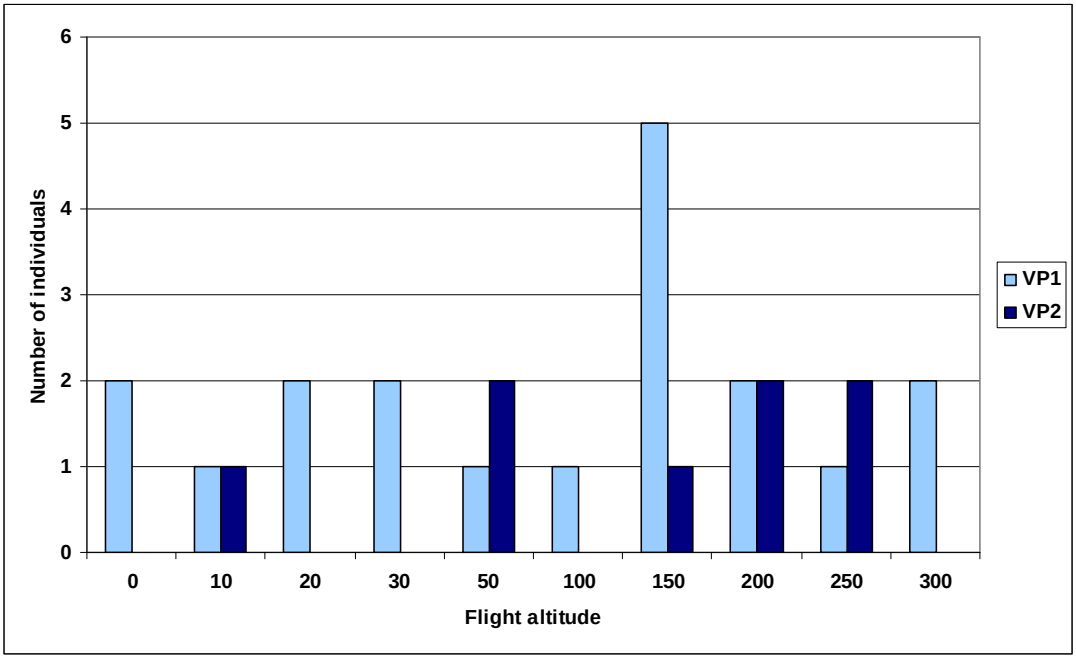

Figure 44. Flight altitude during the winter time

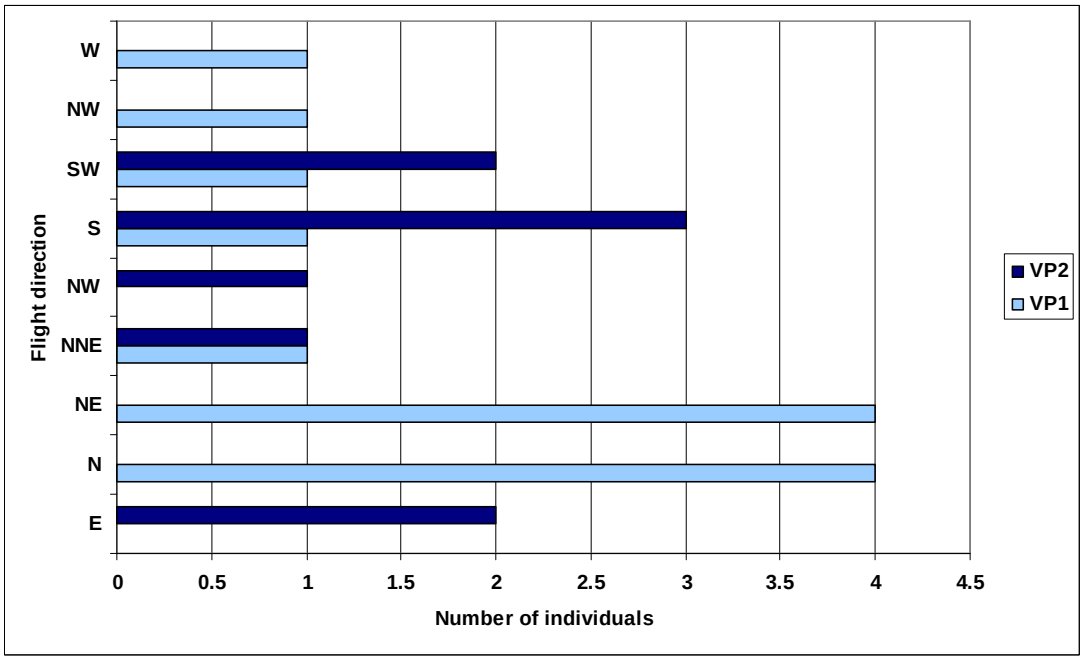

Figure 45. Flight direction during the winter time

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For the observations from VP, conducted during the month of December 2012 (figure 44 and 45), it was found that the main flight directions were those generally dominant for the area, namely the N and NE. Most flights were recorded at an altitude of 150 meters, and the fewest at 10 meters. Two specimens of the *Corvus cornix* species were registered at a short distance from the observers, at ground level.

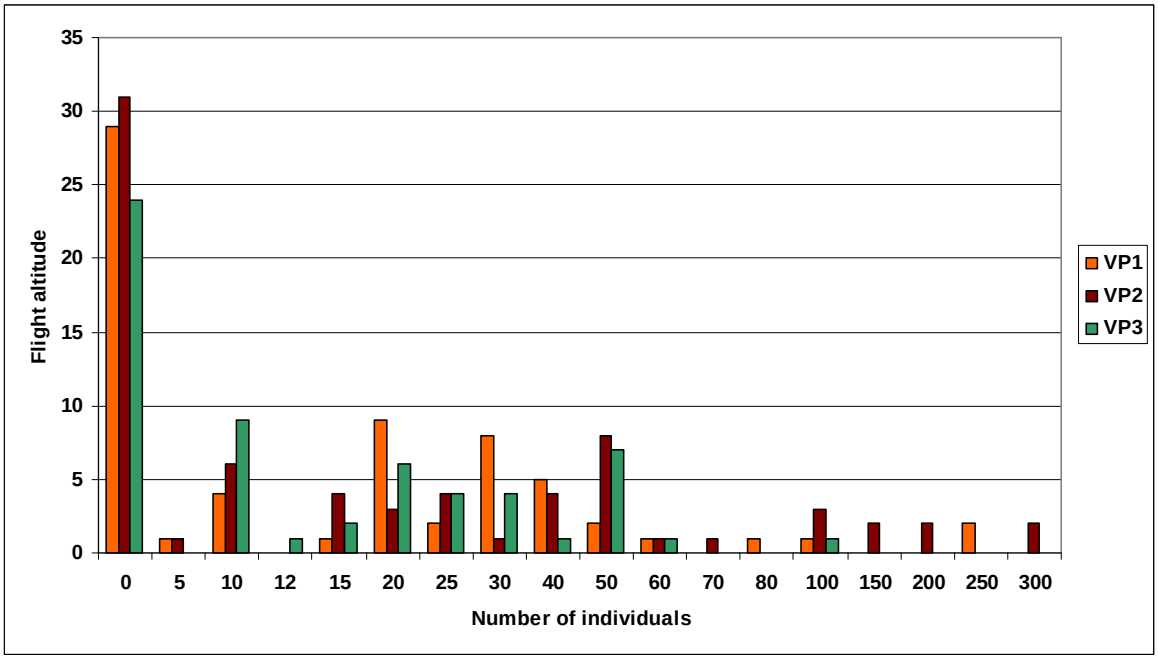

Figure 46. Flight altitude during the 2012 spring migration

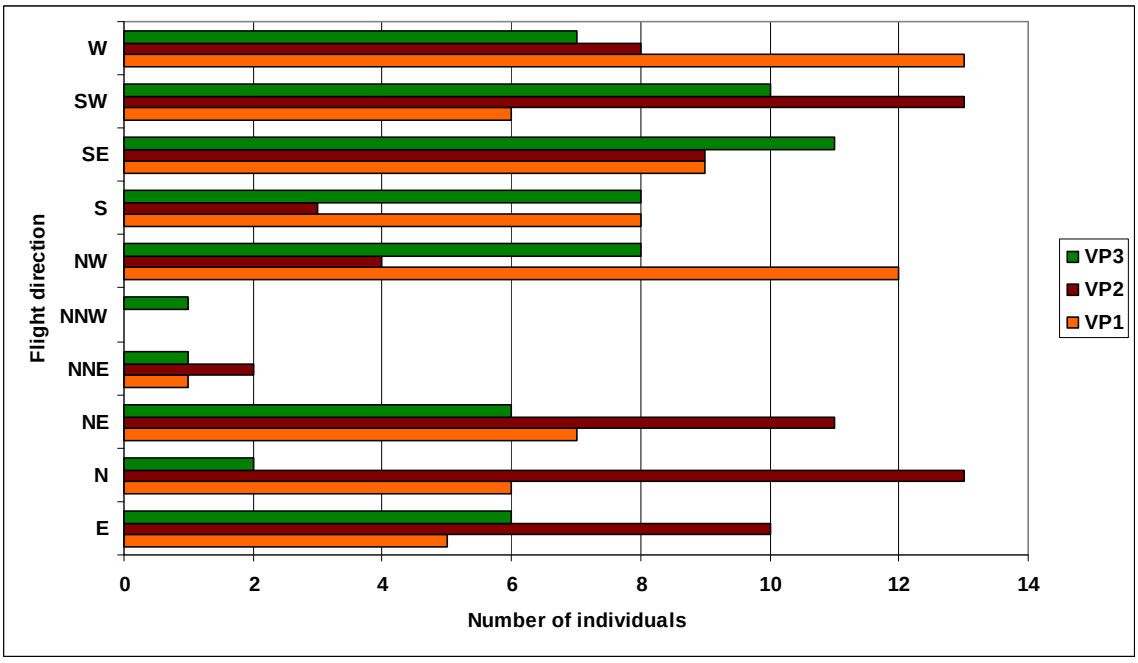

Figure 47. Flight direction during the 2012 spring migration

The analysis of the flight activity of birds during the Spring migration period of 2012 shows that the main flight directions were predominantly the Northern ones (N, NE, SE, SW and

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NW), while flights on Southern, Eastern or Western directions have registered a much lower number of flights (figure 47 and 47).

In terms of flight altitudes, they are predominantly at a flight level between 30 and 160 meters.

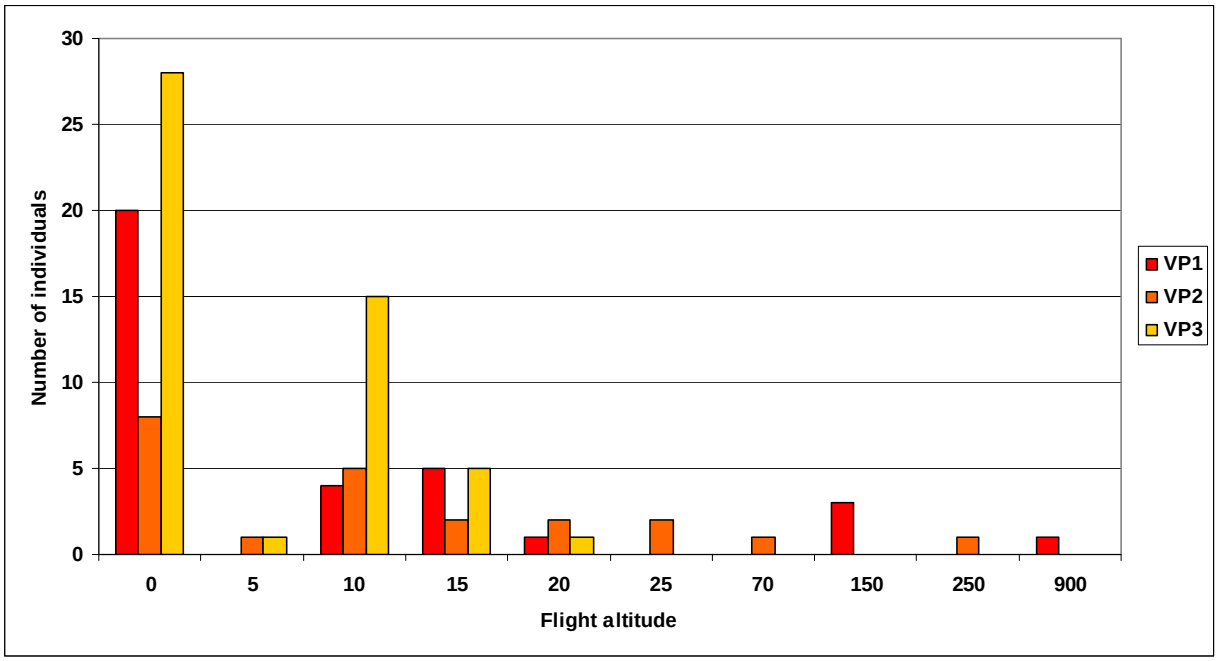

Figure 48. Flight direction during the 2012 breeding season

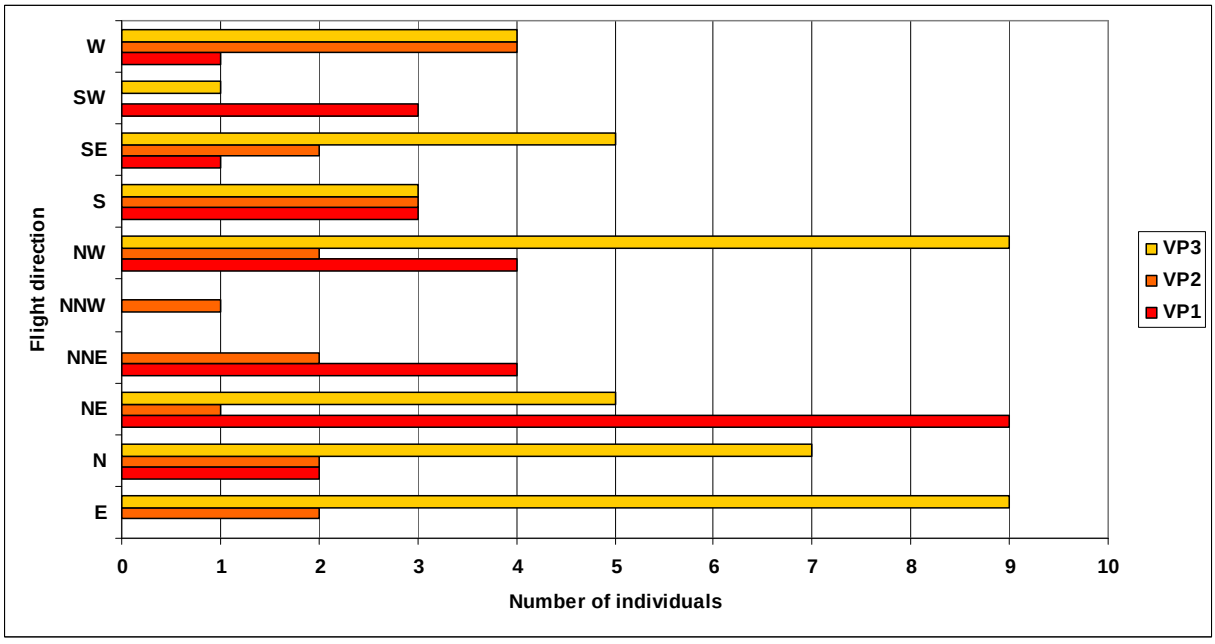

Figure 49. Flight direction during the 2012 breeding season

For the period corresponding to the Nesting season2012, it is observed that flights at altitudes above 50 meters were significantly fewer (about 20 flights). While most flights were below the level of 30 meters, which shapes the flight pattern of the species nesting in the vicinity of the study area. Also, flight directions are no longer very clear, as birds traveling is less

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directed. Under these conditions, all the main flight directions record roughly equal numbers of movements (figure 48 and49).

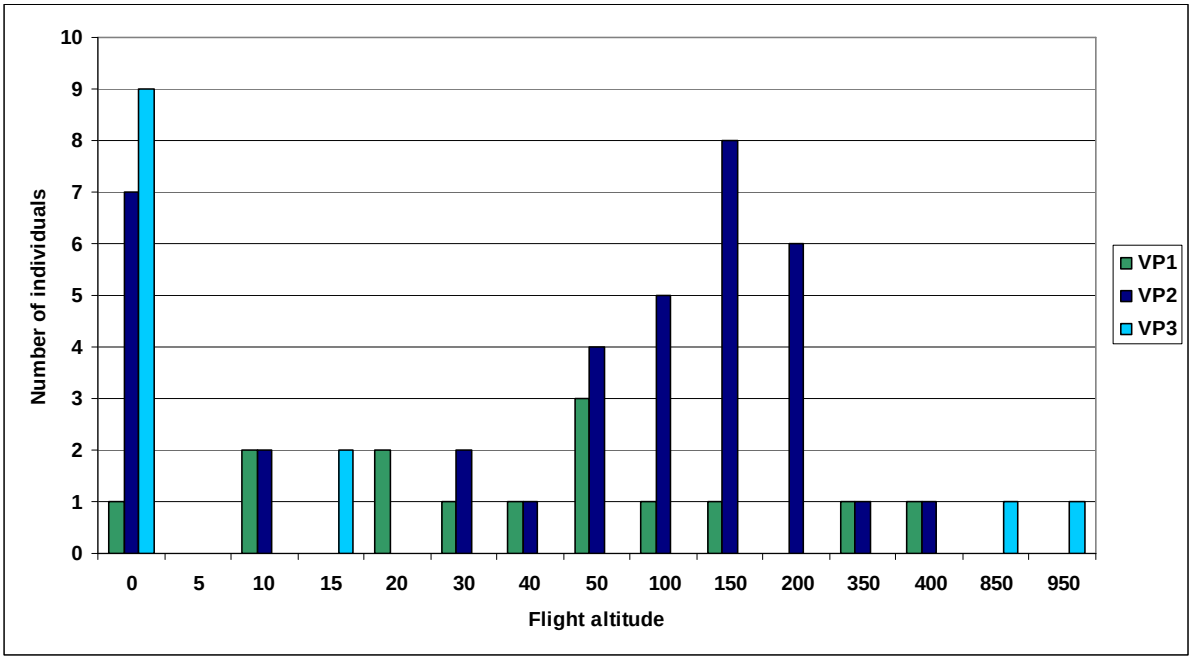

Figure 50. Flight altitude during the 2012 resting time

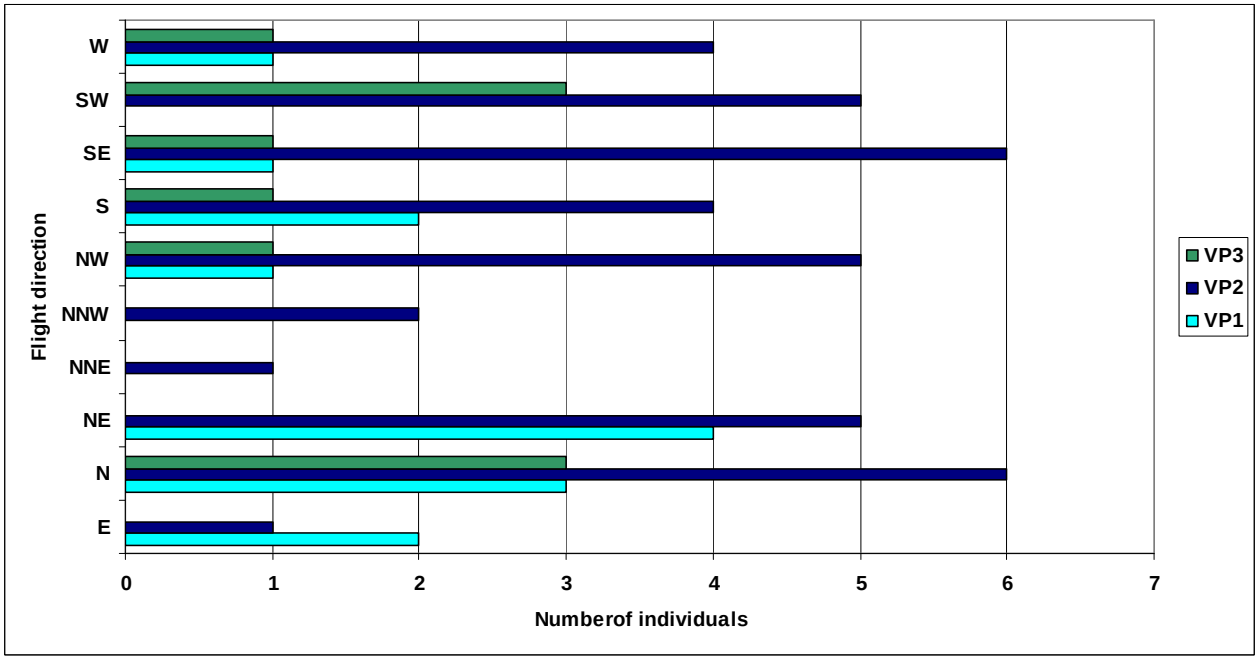

Figure 51. Flight direction during the 2012 resting time

During the resting season (defined as shown above and graphically illustrated in figures 50 and 51), the flight directions no longer follow a dominant route but, as in the nesting period, strictly undirected movements are recorded. We cannot speak, during this period either, of a clear tendency in bird movements, but we can rather talk of routing trips for feeding or, towards the end of the analyzed period, for dispersion.

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In terms of flight altitudes, it is found that they fluctuate, and are generally in the interval of 10-950 meters.

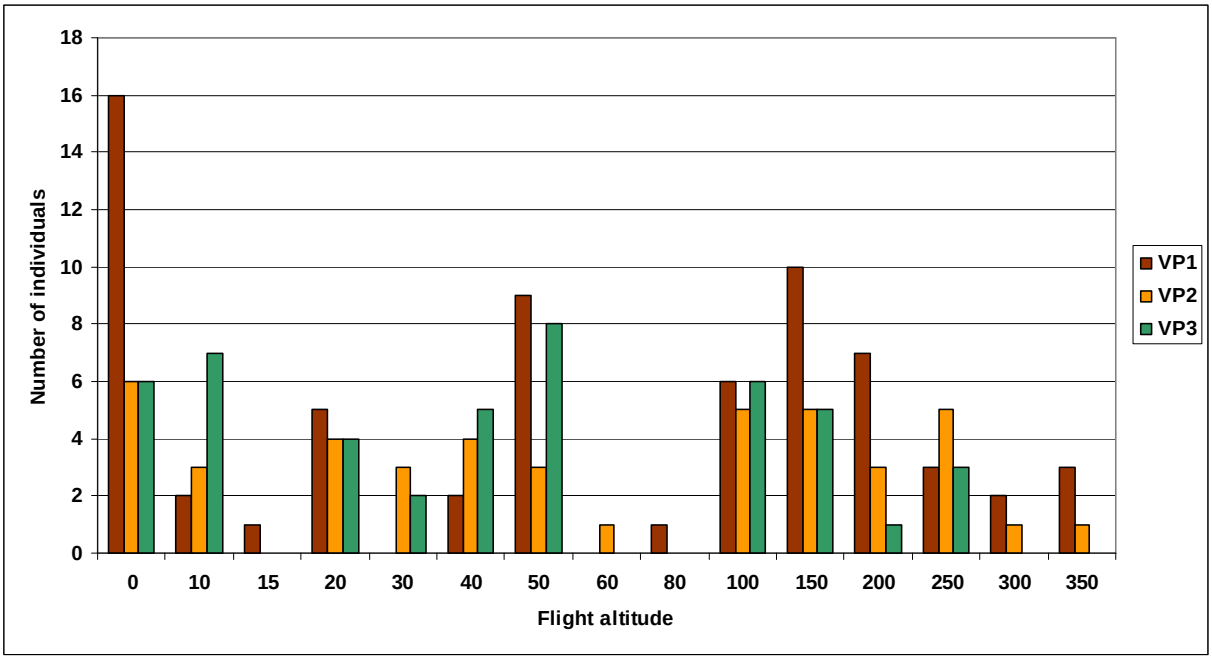

Figure 52. Flight altitude during the 2012 autumn migration

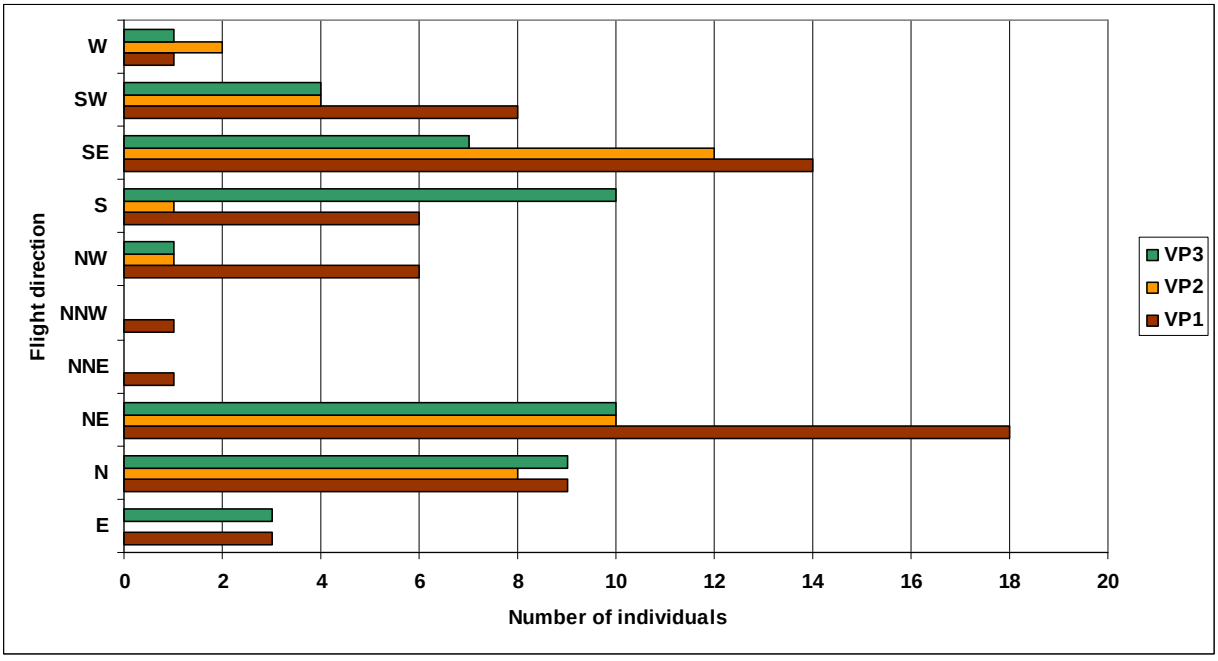

Figure 53. Flight direction during the 2012 autumn migration

During the Autumn migration 2012, the flight directions follow mainly a South and South-East dominant route. Although the number of flights in the registered on a North and North-East or North-West direction continues to be relatively high, summed up, the predominantly Southern routes record most of the observations. This suggests that the area studied is located at the Western limit of a migration corridor.

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In terms of flight altitudes, it is found that they fluctuate, and are generally in the interval of 10-350 meters, with the most number of flights between 20-150 meters.

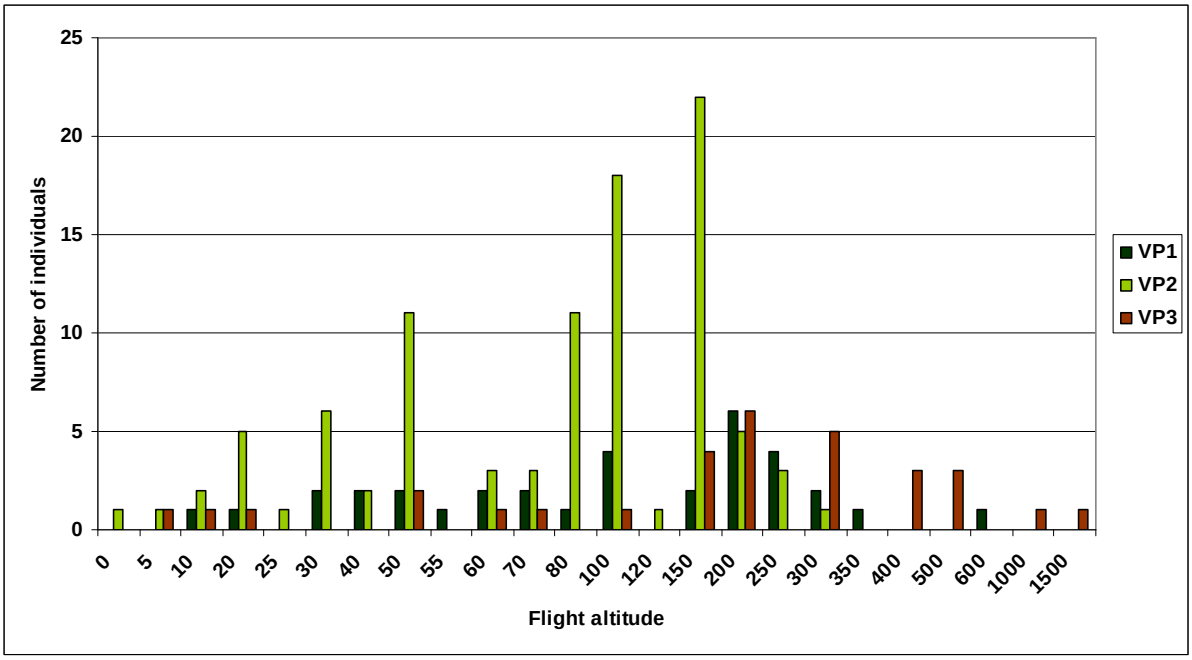

Figure 54. Flight altitude during the 2013 spring migration

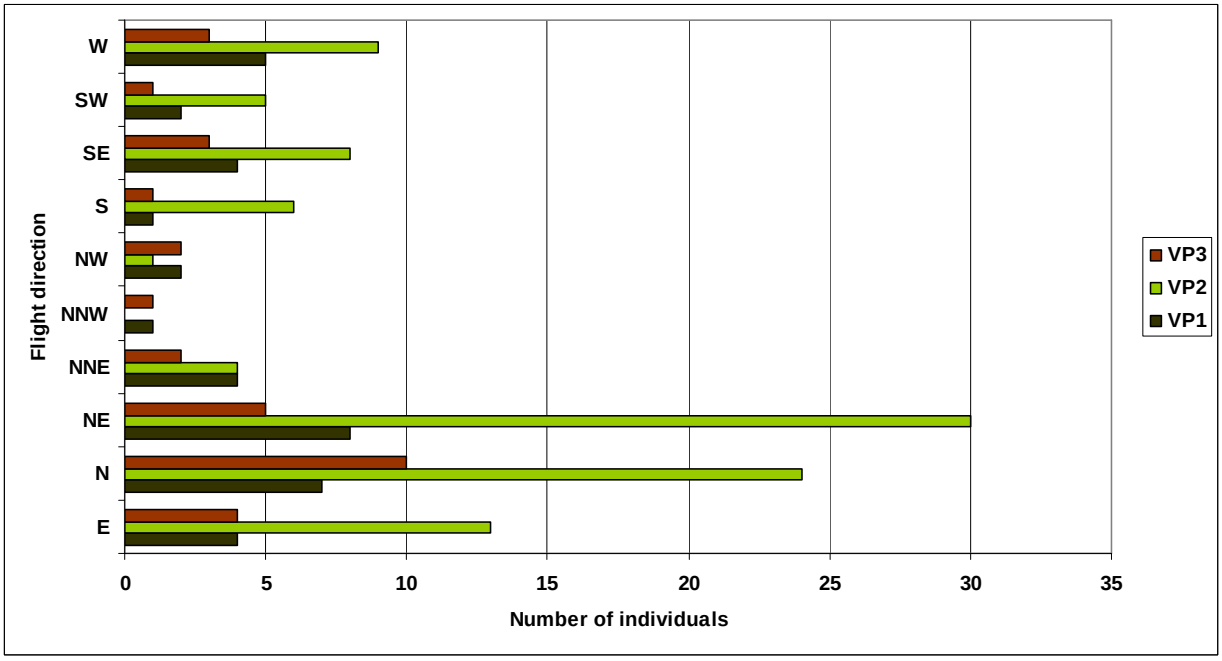

Figure 55. Flight direction during the 2013 spring migration

During the Spring migration period 2013, a new increase of the flight frequency on Northern and North-Eastern directions is recorded, suggesting once again that the investigated area is located on the periphery of a migration corridor, also highlighted by the relatively small number of flights recorded over this period in the monitored area, in relation to the number of flights registered in the in areas East of the site of the future wind farm, and especially in the area from the vicinity of the seashore (figure 55).

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Regarding the flight altitudes, they are situated between very large limits, with flight heights between 10 and 1500 m (figure 54)

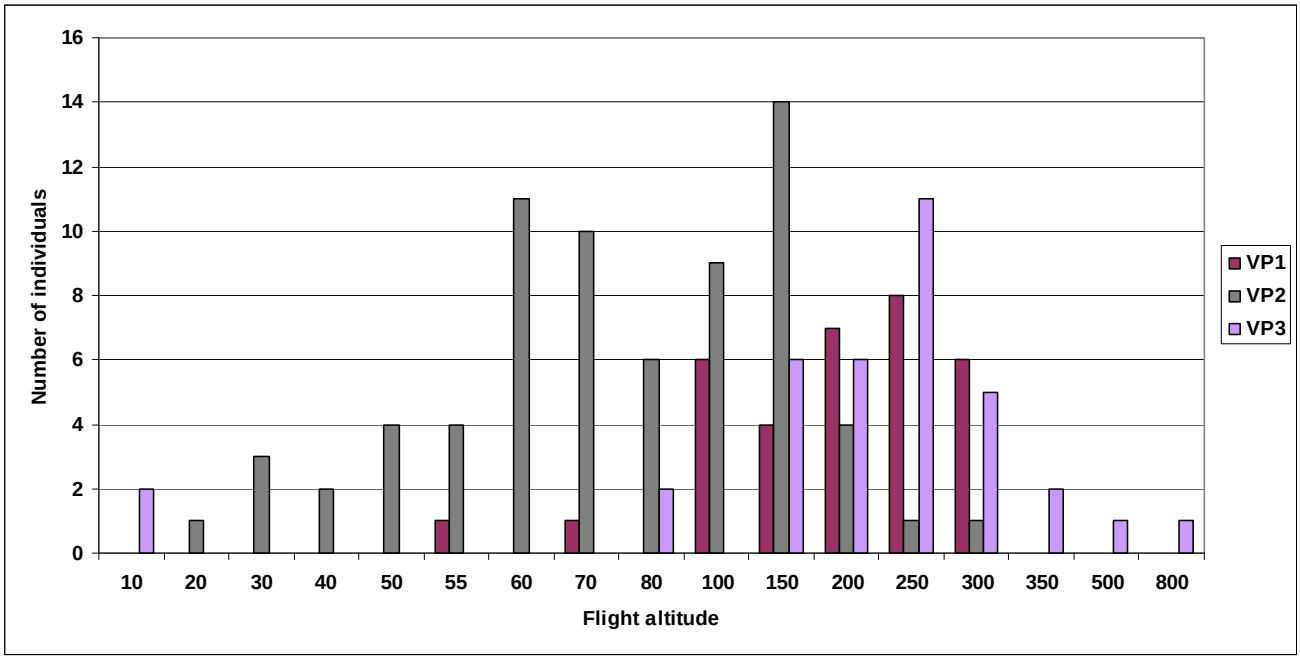

Figure 56. Flight direction during the 2013 breeding season

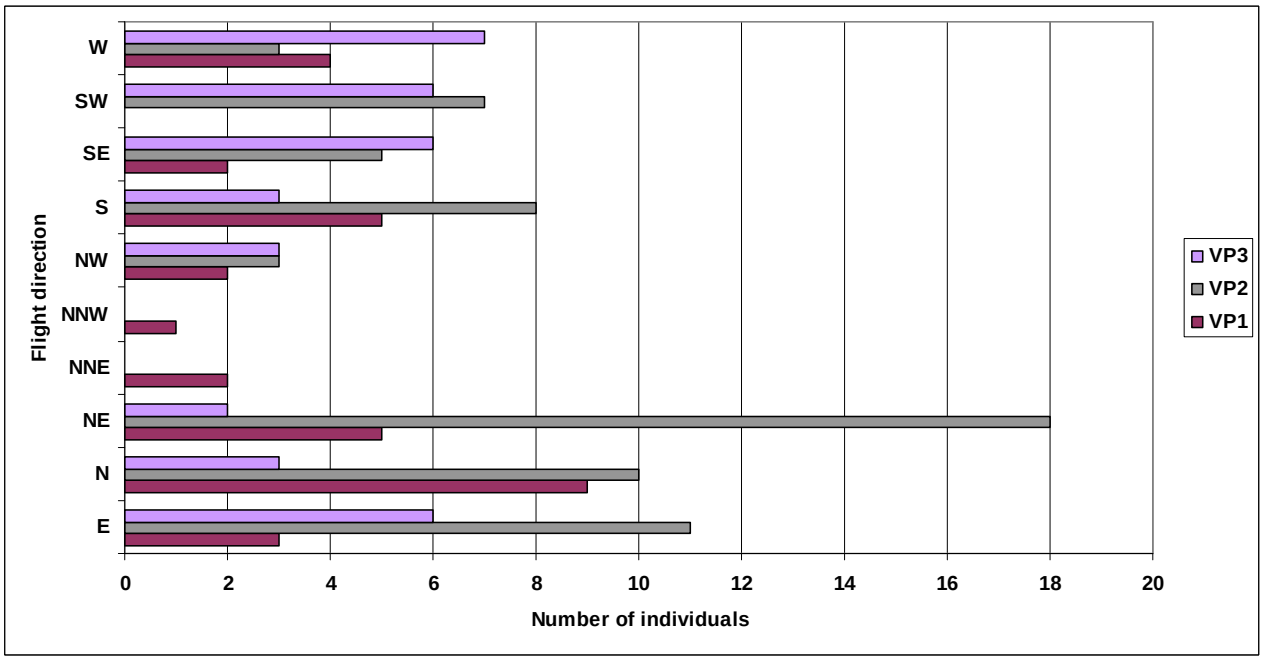

Figure 57. Flight direction during the 2013 breeding season

The period corresponding to the Nesting season 2013, repeats the same pattern detected in the previous nesting season (2012). Note that the flights at altitudes above 50 meters were far fewer (the average was of only 26 flights for the period analyzed). Most flights were below the level of 30 meters. Also, the flight directions are not very clear, the birds having very few

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movements in the territory from the presumed nesting areas. Under these conditions, all the main flight directions record a roughly equal numbers of movements (figure 56 and 57).

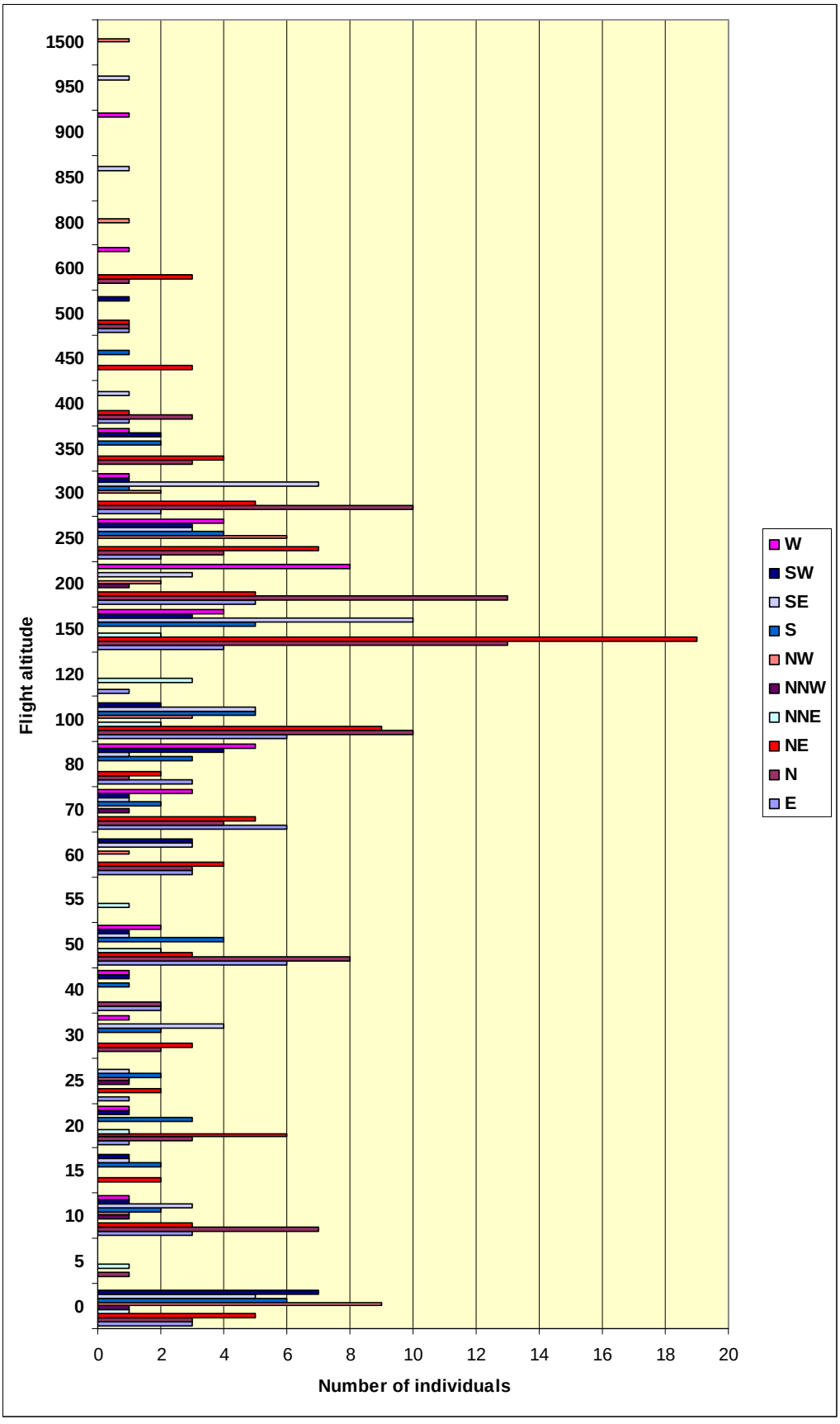

Figure 58. Flight activity of target species potentially affected

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The flight pattern of the bird species considered as target species potentially affected in the study area was analyzed next. Therefore, the data graphically represented in figure 58, show that most species from the group predominantly moved on the Northern direction, and at altitudes generally between a level of 150-160 meters. In relation to the entire study period, the fewest flights were observed at altitudes of over 1500 meters and more, on the NW direction.

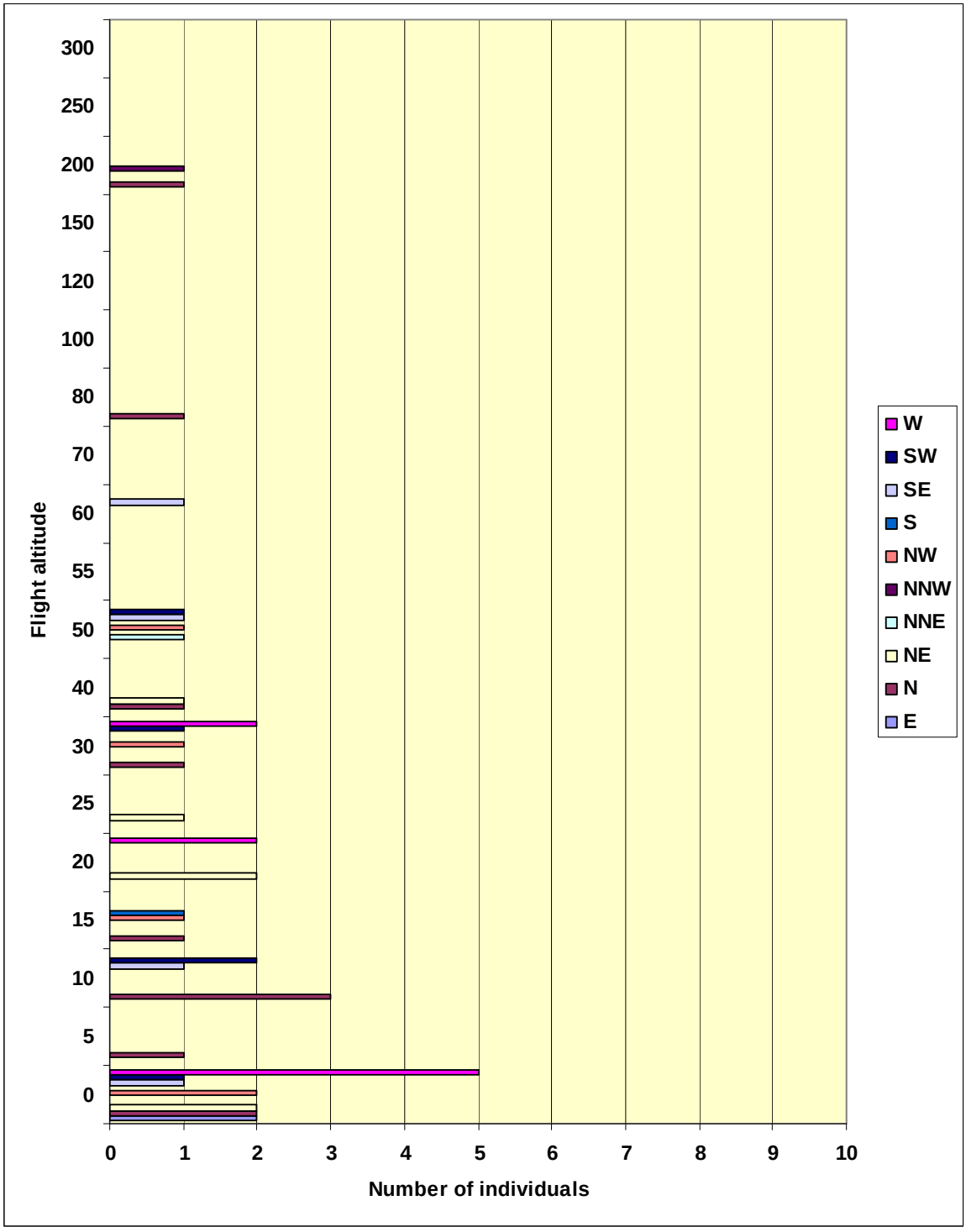

Figure 59. Flight activity of target species not affected

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Regarding the flight activity of the species considered as target species not affected, it was found that most specimens moved on a Western direction, at altitudes between zero and five meters. This suggests that the inclusion of these species in the category mentioned was, indeed, fully justified.

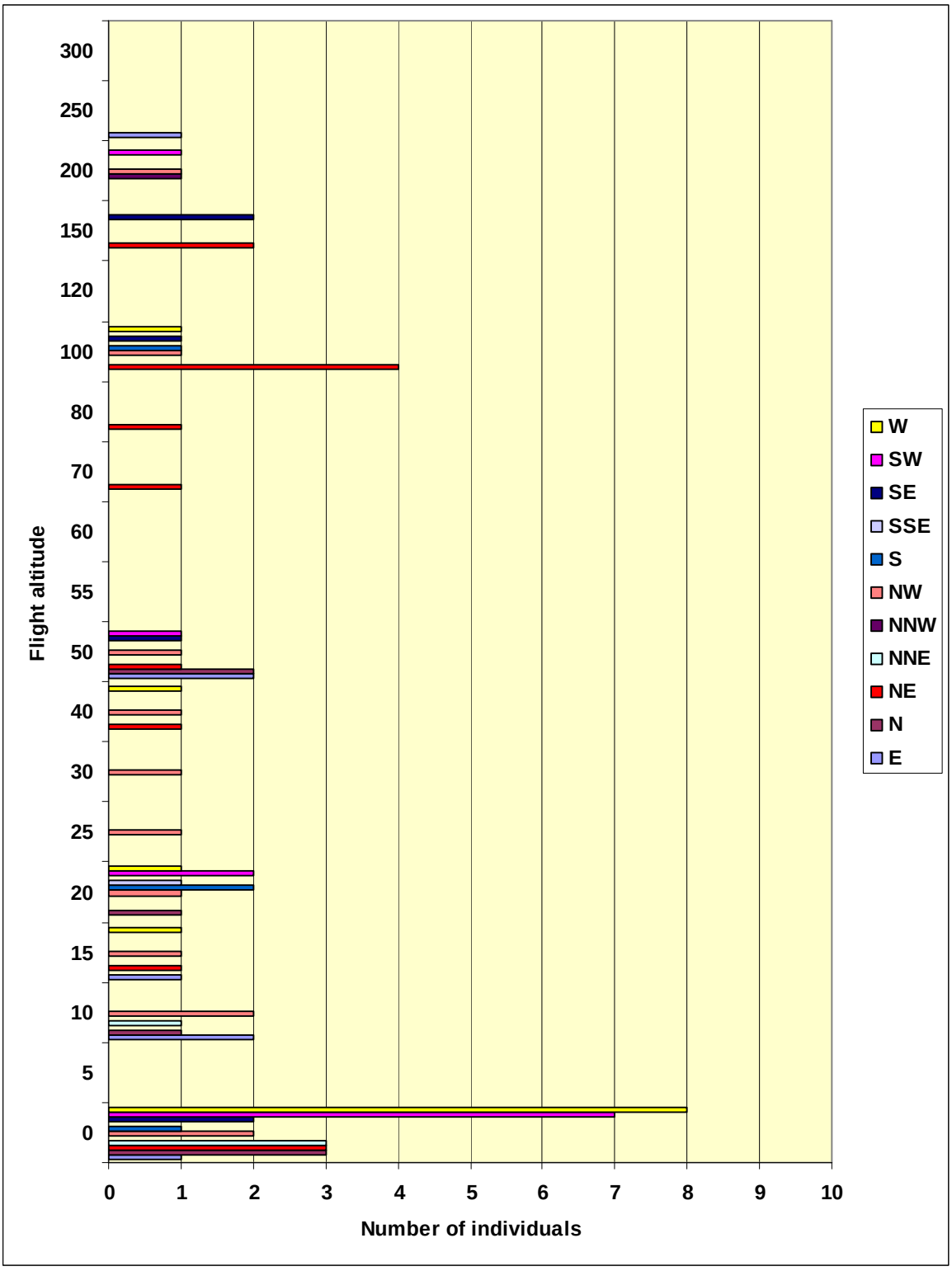

Figure 60. Flight activity of secondary species potentially affected

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Bird species included in the secondary species potentially affected category presented, over the course of the 2012 - 2013 research period, a pattern of activity similar to that of the species from the previous category. Therefore, most species were observed at altitudes between zero and 5 meters, and their predominant flight direction observed was, once again, the Western.

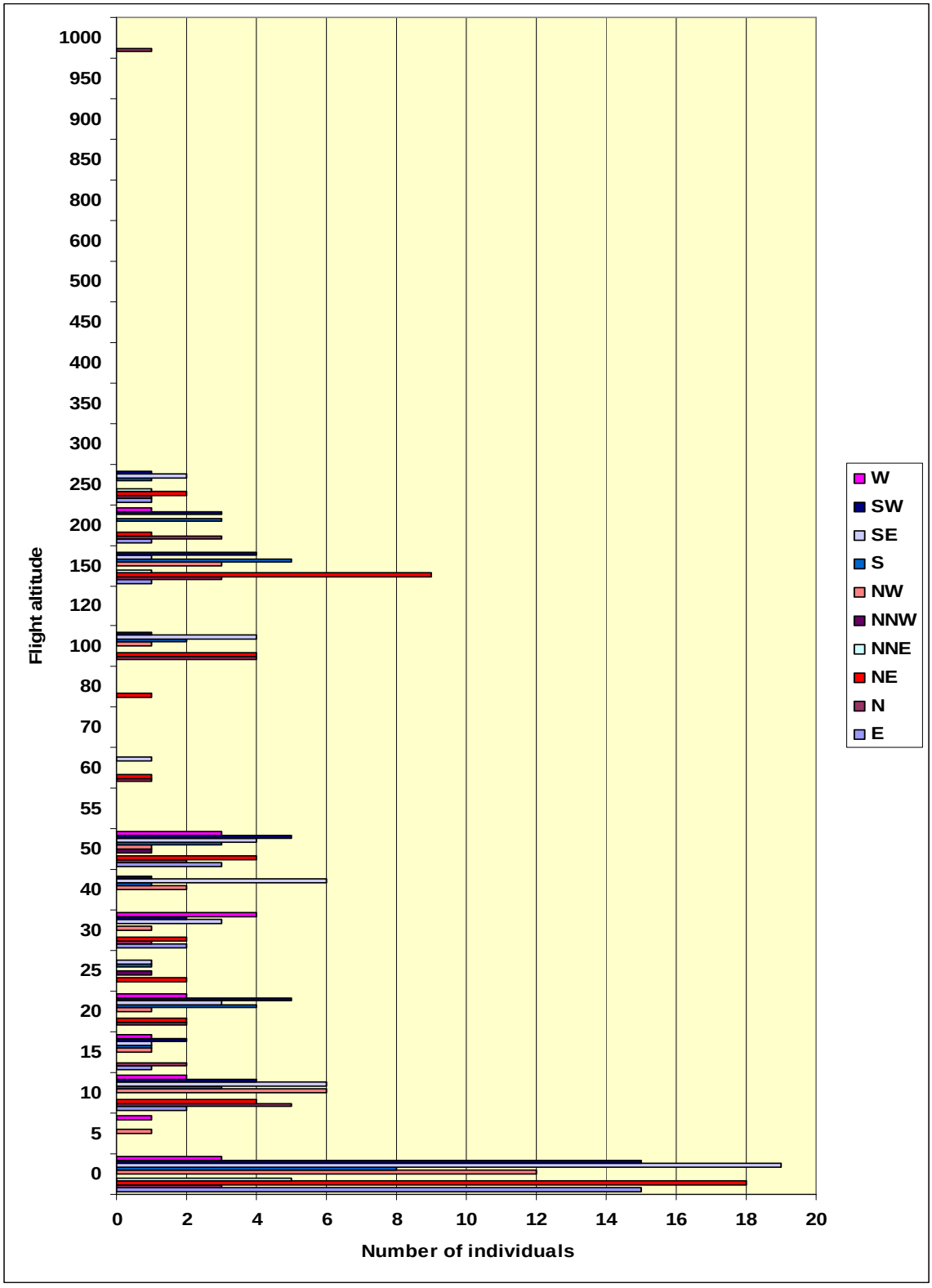

Figure 61. Flight activity of secondary species not affected

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Regarding the bird species not included in the secondary species not affected category, a slightly different situation is found from that of the previous two categories. The graphic from figure 61 integrates the observations regarding these species for the period January 2012 - June 2013, and analyzes the correlations between the flight directions and altitudes at which they were made. From this point of view, it is found that there are no prevailing flight directions, and the altitudes at which they were made are generally low, between 0 and 250 meters. Only in a single case, a flight at the altitude of 1000 meters was recorded.

5.2 Bats

In Appendix 6 we present details regarding the biology and ecology of each bat target species.

During bat monitoring between March-June 2013, the following observations were conducted:

Table 38. Period of observations and numbers of observations

Bat species observed	Period of observations and numbers of observations				
	March	April	May	June	Total observations
Barbastella barbastellus	0	0	2	2	4
Eptesicus serotinus	0	0	14	8	22
Myotis daubentonii	0	4	2	2	8
Nyctalus leisleri	0	2	3	3	8
Nyctalus noctula	0	1	1	0	2
Pipistrellus pipistrellus	0	7	7	6	20
Plecotus auritus	0	0	0	1	1
Rhinolophus ferrumequinum	0	0	2	0	2

Below, we present the estimates of target species populations from the studied and from the region:

Table 39. Bat target species

Bat target species	Estimated population according to the Red Book of Vertebrates from Romania (2005)
Barbastella barbastellus	≈3500 individuals
Eptesicus serotinus	≈2500 individuals
Myotis daubentonii	≈500 individuals
Myotis myotis	5000 individuals
Nyctalus leisleri	<=1000 individuals
Nyctalus noctula	No information
Pipistrellus nathusii	<=5000 individuals
Pipistrellus pipistrellus	No information
Plecotus auritus	<=3000 individuals
Rhinolophus ferrumequinum	<14000 individuals

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Figure 62. Distribution of bat species observed from points ST 12, ST 13 and ST 14

Figure 63. Distribution of bat species observed from point 1

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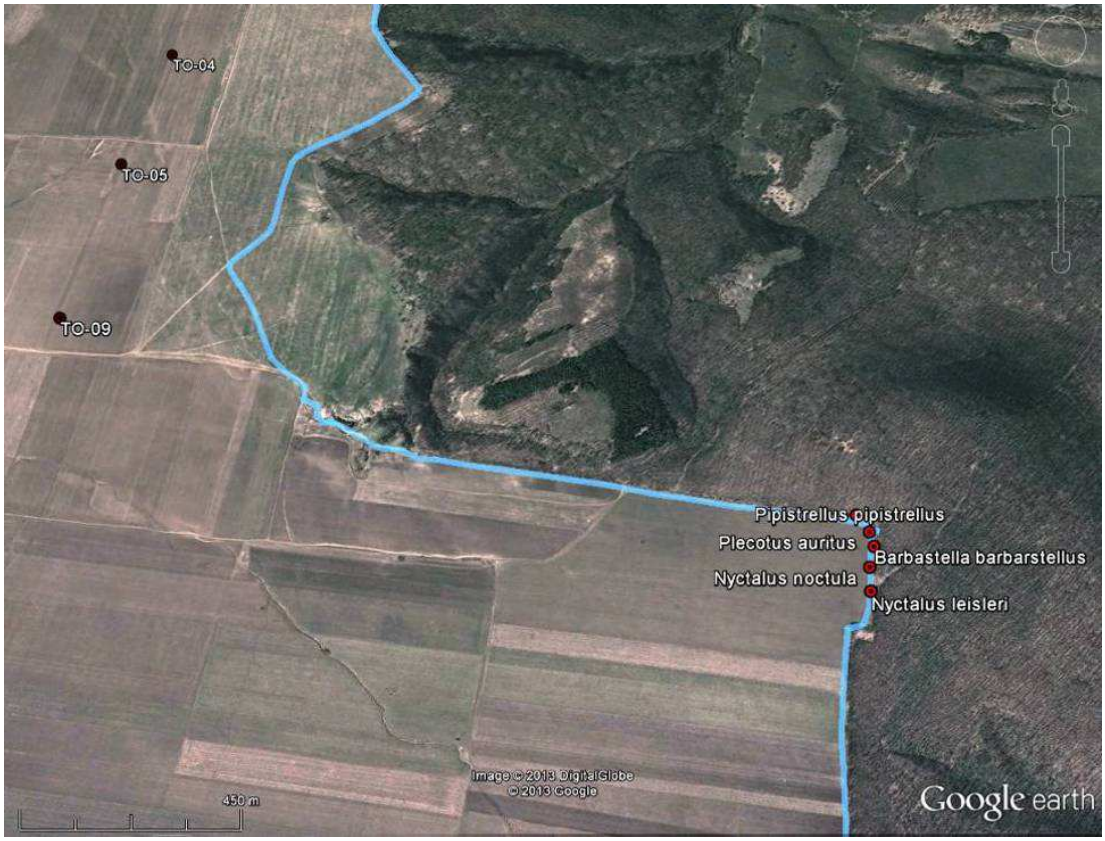

Figure 64. Distribution of bat species observed from points 2 and 3

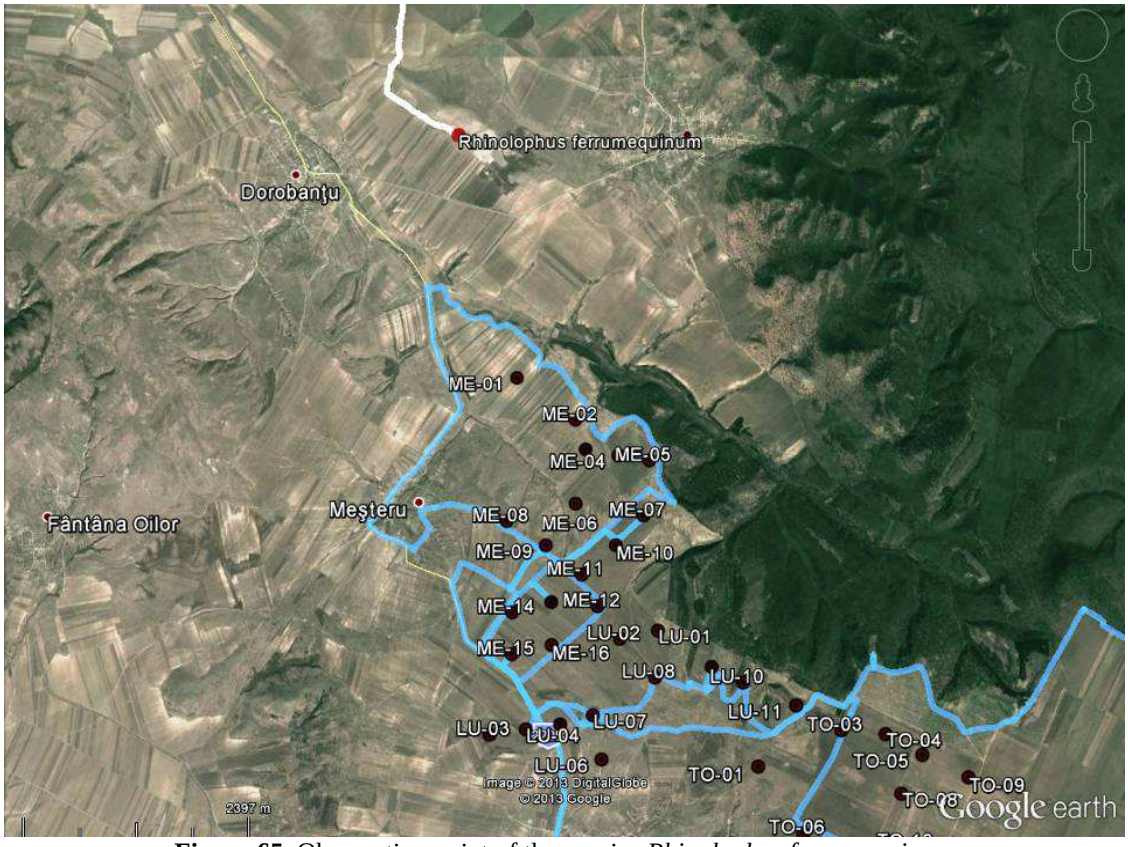

Figure 65. Observation point of the species *Rhinolophus ferrumequinum*

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Regarding the areas where buts were observed, **the areas with the higher abundance of species are** points 1, 2 and 3, located 1-10 m from the edge of Babadag Forest, where the majority of the ultrasounds recordings were performed. The presence of bats, but with a much lower abundance (1-2 specimens/ hour) was also recorded in points ST 13 and ST 14 near the location of the turbines ME 02, ME 03, ME 04 and ME 05. In the case of points 1, 2 and 3, the abundant presence of the bats is explained by the specific conditions provided by the clearings of Babadag Forest, namely the attenuation of the powerful air currents by the forestry vegetation, and due to the abundant trophic resources in the ecotone area.

Most of the sounds recorded represented signals emitted during the hunting activities of bats, the maximum intensity of the activity of the specimens being reached between the hours 9 PM - 11 PM and 5 AM - 6 AM, with small alterations of these intervals, according to the calendar date the observations were made .

We mention that in the other observation points, no chiropters were recorded following the bio-acoustic monitoring. This is due to the location of the site in an open area, characterized by air currents with increased intensity and low trophic resources.

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6. IMPACT ASSESSMENT

6.1. Birds

Given the risks posed by the presence of the wind farm, the bird species present in the area – either directly observed during monitoring, or potentially present according to the existing bibliographic data, can be divided into three categories: target species potentially affected, target species not affected, secondary species affected and secondary species not affected.

The impact can be revealed through:

- the barrier effect, which leads to birds avoiding or detouring around the area where the turbines are located, and therefore birds of passage/migratory birds will try to avoid the area, which requires an extra effort and energy consumption;
- loss of habitats, by building the actual infrastructure, and through the temporary or permanent dislocation of species from the area of the wind farm to other areas, with similar habitats to those found in the studied area;
- the risk of collision with wind turbines.

6.1.1. List of species potentially affected

Next, we present the list of target species and secondary species considered to be potentially affected, as well as those considered to be unaffected by the construction and operation of the wind farm:

Table 40. Bird species categories (concerning the impact of the wind farm)

Target Species potentially affected	Target Species not affected	Secondary species potentially affected	Secondary species not affected
Accipiter brevipes	*Aegithalos caudatus*	*Alauda arvensis*	*Columba palumbus*
Accipiter gentilis	*Athene noctua*	*Ardea cinerea*	*Corvus cornix*
Accipiter nisus	*Carduelis cannabina*	*Emberiza citrinella*	*Corvus frugilegus*
Anthus campestris	*Carduelis carduelis*	*Hirundo rustica*	*Corvus monedula*
Aquila heliaca	*Carduelis chloris*	*Perdix perdix*	*Cuculus canorus*
Aquila pomarina	*Carduelis flammea*	*Riparia riparia*	*Dendrocopos major*
Asio flammeus	*Carduelis spinus*	*Sturnus vulgaris*	*Fringilla coelebs*
Burhinus oedicnemus	*Coccothraustes coccothraustes*		*Galerida cristata*
Buteo buteo	*Coracias garrulus*		*Garrulus glandarius*
Buteo lagopus	*Corvus corax*		*Hippolais icterina*
Buteo rufinus	*Dendrocopos medius*		*Lanius senator*
Calandrella brachydactyla	*Dryocopus martius*		*Lanius excubitor*
Ciconia ciconia	*Erithacus rubecula*		*Oenanthe isabellina*

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Ciconia nigra	*Falco cherrug*		*Oenanthe oenanthe*
Circaetus gallicus	*Falco peregrines*		*Parus lugubris*
Circus aeruginosus	*Falco subbuteo*		*Passer domesticus*
Circus cyaneus	*Ficedula parva*		*Passer montanus*
Circus macrourus	*Jynx torquilla*		*Phalacrocorax carbo*
Circus pygargus	*Lanius collurio*		*Phasianus colchicus*
Emberiza hortulana	*Lanius minor*		*Pica pica*
Falco tinnunculus	*Lullula arborea*		*Saxicola torquata*
Falco vespertinus	*Motacilla alba*		*Streptopelia decaocto*
Haliaeetus albicilla	*Motacilla flava*		*Streptopelia turtur*
Hieraaetus pennatus	*Muscicapa striata*		*Sylvia atricapilla*
Melanocorypha calandra	*Oenanthe pleschanka*		*Sylvia curruca*
Merops apiaster	*Oriolus oriolus*		*Turdus merula*
Miliaria calandra	*Otus scops*		*Turdus philomelos*
Milvus migrans	*Panurus biarmicus*		
Pandion haliaetus	*Passer hispaniolensis*		
Pelecanus crispus	*Phoenicurus ochruros*		
Pelecanus onocrotalus	*Phoenicurus phoenicurus*		
Pernis apivorus	*Phylloscopus collybita*		
Tadorna ferruginea	*Phylloscopus sibilatrix*		
Tyto alba	*Picus canus*		
	Picus viridis		
	Sitta europaea		
	Strix aluco		
	Sturnus roseus		
	Sylvia nisoria		
	Upupa epops		

Of the 74 species considered to be target species, 34 species can be considered as affected by the implementation of the wind farm, in one way or another.

The list of target species affected includes 21 species of diurnal and nocturnal raptors, 7 species characteristic to habitats of steppes, forest-steppes, areas with rocks or agricultural crops, and 6 migratory species. Of these species, 9 - *Accipiter brevipes, Burhinus oedicnemus, Pelecanus crispus, Tyto alba, Haliaeetus albicilla, Milvus migrans, Ciconia nigra, Emberiza hortulana, Tadorna ferruginea,* - were not identified during monitoring.

The species not affected were considered those that can occasionally cross through the area, and for which the potential impact of the implementation of the wind farm can be considered negligible.

The list of not affected target species includes 40 species, most of which are forest species - woodpeckers, *Sitta europaea*, *Lullula arborea*, *Oriolus oriolus*, *Otus scops*, etc, small sized

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migratory species - *Carduelis cannabina, Carduelis carduelis, Erithacus rubecula, Motacilla alba, Motacilla flava* etc., species characteristic for open habitats - *Upupa epops*, *Sturnus roseus* etc. - and a reduced number of prey species, that were not identified in the area: *Falco cherrug*, *Falco peregrinus*, *Falco subbuteo*.

Of the target species considered as not affected, the following species were not observed in the study area: *Aegithalos caudatus, Carduelis flammea, Carduelis spinus, Coccothraustes coccothraustes, Corvus corax, Dryocopus martius, Falco cherrug, Falco peregrinus, Falco subbuteo, Jynx torquilla, Muscicapa striata, Panurus biarmicus, Phoenicurus ochruros, Phoenicurus phoenicurus, Phylloscopus collybita, Phylloscopus sibilatrix, Picus canus, Picus viridis, Sturnus roseus, Sylvia nisoria, Passer hispaniolensis, Oenanthe pleschanka.*

Those species that are not protected/of conservative interest, but which may be affected by the construction of the wind farm were considered as secondary species, especially by habitat loss or by the arising of a medium or negligible collision risk.

The list of secondary species includes 34 species, which gathers most of the species characteristic to anthropogenic habitats or to habitats covered by steppe and forest-steppe vegetation, migratory or forest species. In the case of 4 species of the secondary ones, their presence was not identified in the studied area: *Columba palumbus, Hippolais icterina, Parus lugubris* and *Sylvia curruca*.

On the list of secondary species potentially affected, there are species whose representative habitat is encountered in the studied area (pasture and agricultural land), such as *Alauda arvensis* and *Perdix perdix* and species with a collision risk, such as *Ardea cinerea*.

6.1.2. Assessment of the impacts on target species

For the target species, the following types of impact were considered: direct or indirect loss of habitat (displacement through indirect loss of habitat if birds avoid the wind farm and its surrounding area due to turbine operation and maintenance or visitor disturbance, and direct habitat loss through construction of wind farm infrastructure); risk of collision (death through collision or interaction with turbine blades); the barrier effect (birds are deterred from using their normal routes to feeding or roosting grounds). In the Impact Assessment, the stipulations of the *EU Guidance on wind energy development in accordance with the EU nature legislation* have been taken into consideration

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6.1.2.1. Target Species assessed

For each species, a description of the impact was conducted, with the following structure: general aspects, displacement and barrier effect, collision risk (based on the guide drafted by Scottish Natural Heritage), habitat loss and conclusions. For calculation of collision risk the period of assessment it is January 2012 and June 2013.

In this section *No. of the birds with real collision risk / period* represents an estimation of the real number of individuals that can collide with the wind turbines during a period of time (in this case 1 year and a half). Calculation consideres also the avoiding activities toward the wind turbines, the following formula being applied:

No. of the birds with real collision risk / period = No. of the birds with collision risk without avoiding activities x (100 - *avoidance rate*)/100

* calculated using SNH guidance (see the Appendix).

Accipiter brevipes

General aspects. Species which was not identified during monitoring (2006-2013). Isolated specimens may, however, appear during the migration period.

Displacement and barrier effect. The barrier effect is insignificant, as the species migrates as isolated specimens, at altitude.

Potential collision risk. The risk is moderate, considering that it has a similar ecology with other Accipitridae;

Habitat loss. This is not the case. Wind farm footprint does not overlap with potential habitat of the species.

***Conclusions.* The risk for the species is negligible.**

Accipiter gentilis

General aspects. Nesting species, isolated specimens or pairs of the species were identified in the area analyzed (2013). Breeding and nesting in woodland.

Displacement and barrier effect. Insignificant.

Potential collision risk. Potential collision risk, moderate due to their flying and feeding mode.

No. of the birds with real collision risk / period (frequently use the airspace of the wind farm)*:* 0.0236

Habitat loss. Limited, wind farm footprint is not the main hunt habitat of the species.

***Conclusions.* Limited impact risk.**

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Accipiter nisus

General aspects. Accipiter nisus is a sedentary species or a winter guest in Romania. It was not identified as a resident species of the wind farm site, given that it was observed merely occasionally. ***Table 26. Assessment of the likelihood that migratory species are present in the studied area based on habitat presence, field observations, and flying activities***, notes the fact that this species can cross the studied area during migration or occasionally in passage towards other areas with characteristic habitats, during which time it can carry out foraging / hunting activities as well. The areas with anthropogenic habitats and with herbaceous vegetation constitute the feeding niche.

Displacement and barrier effect. The barrier effect is insignificant.

Potential collision risk. Potential moderate collision risk, due to their flying and feeding ways.

No. of the birds with real collision risk / period (in passage)*:* 0.00423

Habitat loss. This is not the case. Wind farm footprint does not overlap with potential areas of breeding and main hunting areas.

Conclusions. **Insignificant impact.**

Anthus campestris

General aspects. Few specimens of the species observed (2006-2013). The area has both habitat niches and nesting and feeding niches.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. Potential risk is high. According to scientific literature, *Anthus campestris* nests in arid areas, prefers areas with steppe vegetation and pastures, and often nests in areas cultivated with grains. (ION, C.(coord.), DOROSENCU, A., BALTAG, E., BOLBOACA, L., 2009: Migration of passeriformes in eastern Romania). Consequently, according to bibliographical data, both pastures and agricultural land can constitute nesting and feeding habitats for this species. Information regarding the presence of feeding and breeding habitats within the wind farm perimeter are found in Table 23. Assessment of the likelihood to find the species in the studied area based on the presence habitat/vegetation. At the same time, ***Table 21. Estimation of resident, breeding or wintering species population within the boundaries of the wind farm*** and ***Table 22. Estimation of resident, breeding or wintering species population in the studied area*** provide estimates of the population sizes both within the perimeter and within the studied area**.**

The layout of the wind farm is as follows: 11 turbines (26,2%) out of a total of 42 are placed in pasture areas, which can constitute both breeding and feeding habitats for pipits.

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As such, the potential impact in terms of the habitat of this species is significant; however, impacts on the species is limited. Depending on data collected via field work such as: the presence of the species in the studied area, the distribution of the species across the habitat, the anthropic impact, measures taken to reduce this impact, the impact over the species itself is a moderate one and compensations are necessary to reduce the risk to insignificant level (see section 7 on mitigations). Please note that (as highlighted at pag 119) most species of Passeriformes are affected only during the construction of the wind farm, as they re-populate the affected areas after the construction work ceases and human presence in the area is reduced.

***Conclusions*. Species at moderate impact risk**

Aquila heliaca

General aspects. Species rarely identified, being present in passage.

Displacement and barrier effect. Moderate barrier effect, due to the height of flight.

Potential collision risk. Moderate risk of collision, due to the large size of the birds.

No. of the birds with real collision risk / period (in passage)*:* 0.00150

Habitat loss. This is not the case. The species do not utilize the area for breeding/hunting/rest.

***Conclusions.* Limited impact risk, due to the low presence in the studied area.**

Aquila pomarina

General aspects. Species dected several times during the monitoring period (2006-2013), nesting in Babadag forest (probably two pairs). The species uses the terrains in the area of the wind farm as a hunting ground.

Displacement and barrier effect. Moderate, due to the large size of the species.

Potential collision risk. The risk is potential moderate, due to the presence of breeding pairs in proximity to the location of the wind farm.

No. of the birds with real collision risk / period (frequently use the airspace of the wind farm)*:* 0.0377

Habitat loss. The loss of feeding habitat a high one, due to the proximity to the nesting niche.

***Conclusions.* Species at moderate impact risk, due to their feeding manner.**

Asio flammeus

General aspects. Isolated specimens of the species found. We estimated that one pair is present in the studied area.

Displacement and barrier effect. This is not the case.

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Potential collision risk. The risk of collision is a potential moderate one, mainly due to their size.

No. of the birds with real collision risk /period (frequently use the airspace of the wind farm)*:* 0.0243

Habitat loss. It is an important one, due to the fact that the species hunts and nests in areas with herbaceus vegetation. The evaluation is an estimate, based on information listed in ***Table 23. Assessment of the likelihood to find the species in the studied area based on the presence habitat/vegetation.***

Conclusions. **Species with a moderate impact risk, taking into consideration the limited presence. Compensation/mitigation measures are recommended (see following sections).**

Burhinus oedicnemus

General aspects. Species that can be encountered in the immediate vicinity of the project analyzed, in the SE area, as isolated specimens, according to the information available. In the studied area, the presence of this species has not been reported

Displacement and barrier effect. This is not the case.

Potential collision risk. The collision risk is negligible, but is present, however, due to the size of the species.

Habitat loss. Habitat loss is moderate; in the area where the wind farm is located, the surfaces suitable for nesting for this species, as well as the feeding niches are reduced surface.

Conclusions. **The species is characterized by a limited risk of impact, being particularly affected by the loss of habitat but never seen during the monitoring. Compensation/mitigation measures are recommended (see following sections).**

Buteo buteo

General aspects. Species nesting in the immediate vicinity of the analyzed area, which it uses as feeding ground.

Displacement and barrier effect. Potential moderate barrier effect, due to its size.

Potential collision risk. The risk of collision is also moderate.

No. of the birds with real collision risk / period (frequently use the airspace of the wind farm)*:* 0.0244

No. of the birds with real collision risk / period (in passage): 0.06953

Habitat loss. The risk of habitat loss is moderate, the species in question having a large hunting territory.

Conclusions. **Species with a potential moderate risk of impact**

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Buteo lagopus

General aspects. Winter guest in the analyzed area, which it uses as feeding ground.

Displacement and barrier effect. Potential moderate barrier effect, due to its size.

Potential collision risk. The risk of collision is also a moderate one.

No. of the birds with real collision risk / period (use the airspace of the wind farm)*:* 0.0024

Habitat loss. The risk of habitat loss is moderate, the species in question having a large hunting territory.

***Conclusions.* Species with a limited risk of impact due to the limited presence, only in winter.**

Buteo rufinus

General aspects. Species nesting in the immediate vicinity of the analyzed area, which it uses as feeding ground.

Displacement and barrier effect. Potential moderate barrier effect, due to its size.

Potential collision risk. The risk of collision is also a moderate one.

No. of the birds with real collision risk / period (frequently use the airspace of the wind farm): 0.0349

No. of the birds with real collision risk / period (in passage): 0.07503

Habitat loss. The risk of habitat loss is moderate, the species in question having a large hunting territory.

***Conclusions.* Species with a potential moderate risk of impact.**

Calandrella brachydactyla

General aspects. Very common species in the area, present in relatively large effectives. Habitats from the area of the wind farm are used as nesting and feeding niches.

Displacement and barrier effect. This is not the case.

Potential collision risk. Low or insignificant collision risk.

Habitat loss. Habitat loss is a risk. The same is true for the species *Anthus campestris.*

***Conclusions.* It is one of the species most likely to be affected by the construction of the wind farm, with a moderate risk of impact. Compensation/mitigation measures are recommended (see following sections).**

Ciconia ciconia

General aspects. Species present in the area during migrations, only in passage. Seen only in 2013. It was not observed in the agricultural areas of the site.

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Displacement and barrier effect. The barrier effect is one with a moderate risk, due to the large size of the storks, and how they migrate in flocks.

Potential collision risk. The risk of collision is high due to the large size of the species.

No. of the birds with real collision risk / period (in passage)*:* 0.16677

Habitat loss. This is not the case.

Conclusions. **Species with limited risk of impact, an evaluation based on the collision risk and also due to the way they migrate above wind farm (high altitude).**

Ciconia nigra

General aspects. The species was not observed in the analyzed area. It is mentioned as a species of passage in the Standard data form of ROSPA Babadag Forest.

Displacement and barrier effect. Potential moderate barrier effect.

Potential collision risk. High, due to the large size of the species.

Habitat loss. This is not the case.

Conclusions. **Insignificant risk of impact.**

Circaetus gallicus

General aspects. Species rarely identified, in isolated specimens. It can use lands covered with herbaceous vegetation and grasslands from the area analyzed as a hunting ground.

Displacement and barrier effect. Potential moderate barrier effect.

Potential collision risk. Moderate collision risk, due to its size.

No. of the birds with real collision risk / period (in passage): 0.00908

Habitat loss. This is not the case.

Conclusions. **Limited impact risk.**

Circus aeruginosus

General aspects. Isolated specimens of the species observed. It feeds in areas with herbaceous vegetation, in pastures and agricultural terrains.

Displacement and barrier effect. Potential moderate barrier effect.

Potential collision risk. Potential moderate collision risk, due to how they feed and the large size of the species.

No. of the birds with real collision risk / period (frequently use the airspace of the wind farm): 0.0078

No. of the birds with real collision risk / period (in passage): 0.02453

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Habitat loss. Loss of habitat with potential moderate risk.

***Conclusions.* Limited impact risk.**

Circus cyaneus

General aspects. Winter guest, isolated specimens rarely identified. They can use lands covered with a herbaceous vegetation and meadows from analyzed area as a hunting ground.

Displacement and barrier effect. Potentially moderate barrier effect.

Potential collision risk. Potentially moderate collision risk.

No. of the birds with real collision risk / period (use the airspace of the wind farm)*:* 0.0022

No. of the birds with real collision risk / period (in passage): 0.00864

Habitat loss. This is not the case.

***Conclusions.* Limited impact risk.**

Circus macrourus

General aspects. Species in passage through the studied area, as isolated specimens. They can use lands covered with a herbaceous vegetation and meadows from analyzed area as a hunting ground

Displacement and barrier effect. Potential moderate barrier effect.

Potential collision risk. Potential moderate collision risk.

No. of the birds with real collision risk / period (in passage): 0.00342

Habitat loss. This is not the case.

***Conclusions.* Limited impact risk.**

Circus pygargus

General aspects. Species rarely identified, only in passage, and in a reduced number of specimens. They can use lands covered with herbaceous vegetation and meadows from analyzed area as a hunting ground.

Displacement and barrier effect. Potential moderate barrier effect.

Potential collision risk. Potential moderate collision risk.

No. of the birds with real collision risk / period(in passage)*:* 0.01035

No. of the birds with real collision risk / period (use the airspace of the wind farm): 0.0072

Habitat loss. This is not the case.

***Conclusions.* Limited impact risk.**

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Emberiza hortulana

General aspects. Species identified in areas with shrub vegetation, isolated or in small groups.

Displacement and barrier effect. This is not the case.

Potential collision risk. Reduced risk of collision, due to low flight altitudes.

Habitat loss. High risk of habitat loss, due to the use of lands with shrubs or herbaceous vegetation as a food and shelter niche.

Conclusions. Moderate impact risk species. Compensation/mitigation measures are recommended (see following sections).

Falco tinnunculus

General aspects.. Species nesting in the proximity of the site of the wind farm, which uses the lands from the analyzed area as hunting grounds.

Displacement and barrier effect. Insignificant barrier effect.

Potential collision risk. Low collision risk.

No. of the birds with real collision risk / period (frequently use the airspace of the wind farm): 0.1580

No. of the birds with real collision risk / period (in passage): 0.01275

Habitat loss. Loss of habitat is a high one, during the installation of the turbines, because this species uses the site of the wind farm for feeding. Drawing on the experience of the evaluator we can conclude that *Falco tinnunculus* populations are not affected by the operation of the wind farm. These birds continue to use the wind farm site as a feeding area.

***Conclusions.* Species characterized by a moderate risk of impact.**

Falco vespertinus

General aspects. Nesting species, identified as isolated specimens or small groups (2-5 individuals), they use the lands in the area analyzed as hunting grounds.

Displacement and barrier effect. Insignificant barrier effect.

Potential collision risk. Low collision risk.

No. of the birds with real collision risk / period (frequently use the airspace of the wind farm): 0.0351

Habitat loss. The loss of habitat is a risk, especially during the installation of the turbines.

***Conclusions.* Species characterized by moderate risk of impact.**

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Haliaeetus albicilla

General aspects. Species which was not identified during monitoring, neither during the nesting period nor during the migration period. Mentioned in the Standard Data Form of ROSPA Babadag Forest.

Displacement and barrier effect. Potentially moderate barrier effect, due to the large size of the species.

Potential collision risk. Potential moderate collision risk, due to its size. Given that solely two nesting individuals are included in the Standard Data Form of ROSPA Babadag Forest, and potential nesting areas are located approximately 20 km to the East of the analyzed wind farm, the probability that individuals belonging to this species collide with wind turbines in the Topolog - Mesteru – Dorobantu area is very small.

Habitat loss. This is not the case, the species nests on river banks, that is also where it feeds, and it can occasionally seek shelter in forests.

***Conclusions.* Species not identified, with negligible impact risk, given the results from field observations and the large distance between the wind farm and the potential nesting areas.** This conclusion is also based on bibliographical information, such as the RSPB Research Report No 20, J. A. Bright et all, 2006 - *as part of a programme of work jointly funded by the RSPB and Scottish Natural Heritage*, which notes that „White-tailed Eagle home ranges (1km squares) and nest locations were buffered by a radius of 5km, and this area classified as 'high sensitivity'. This precautionary distance is considered reasonable based on the extremely small and localised nature of the population

Hieraaetus pennatus

General aspects. Species that nests in the vicinity of the analyzed area, using areas with herbaceous vegetation habitats and agricultural lands as hunting grounds.

Displacement and barrier effect. Potentially moderate barrier effect, during the migration.

Potential collision risk. Potential moderate collision risk, due to its size.

No. of the birds with real collision risk / period (frequently use the airspace of the wind farm): 0.0306

No. of the birds with real collision risk / period (in passage): 0.00482

Habitat loss. Potential high risk of the feeding habitat loss. This risk is particularly present during the wind farm construction period when human presence at the site along with noise caused by heavy equipment can constitute a factor of disturbance for the feeding habitat. Given that the site is not a preferred feeding area, a conclusion resulting from observations carried out before the

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onset of the construction works, as well as the fact that Chapter 7 includes measures for reducing human impact in the post-construction stage, we believe that the local population will not undergo a change in numbers.

Conclusions. **Species characterized by moderate risk of impact**

Melanocorypha calandra

General aspects. Species present in relatively large effectives, nesting in the area, and using the agricultural terrains and pastures as feeding ground.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. Habitat loss at high risk, due to the ecology of the species. This is also the case for the *Anthus campestris* species.

Conclusions. **Species with a potentially moderate impact risk. Compensation/mitigation measures are recommended (see following sections).**

Merops apiaster

General aspects. The species nests in the ravines from the North of the analyzed area. It feeds on the location of the wind farm.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. Te loss of habitat is one at potential moderate risk.

Conclusions. **Species with a limited impact risk. Compensation/mitigation measures are recommended (see following sections).**

Miliaria calandra

General aspects. Species present in relatively large effectives in the area, nesting in the area, and using the agricultural lands and pastures as feeding grounds.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. Loss of habitat is at high risk, due to the ecology of the species.

Conclusions. **Species with a potential moderate impact risk. Compensation/mitigation measures are recommended (see following sections).**

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Pandion haliaetus

General aspects. Isolated specimens of the species were identified, only in passage. The habitat characteristic to this species are wetlands.

Displacement and barrier effect. The barrier effect is a potential moderate one, due to the large size of the species.

Potential collision risk. The collision risk is moderate, for the same reason (large size of the species).

No. of the birds with real collision risk / period (in passage)*:* 0.00612

Habitat loss. This is not the case.

***Conclusions.* Limited impact risk.**

Pelecanus onocrotalus

General aspects. The species was only identified in the area during migration.

Displacement and barrier effect. Potentially moderate barrier effect, due to great flight heights

*Potential collision risk.*The collision risk is potential moderate, due to the size and the way it migrates. No significant effectives of pelicans were identified in the area during migration, as the site is located in the inner Dobrogea, and is not located on major migration routes characteristic for the species.

No. of the birds with real collision risk / period (in passage)*:* 0.18360

Habitat loss. This is not the case.

***Conclusions.* Negligible impact risk.**

Pelecanus crispus

General aspects. The species was not identified in the area.

Displacement and barrier effect. Potential moderate barrier effect, due to great flight heights.

Potential collision risk. Potential moderate collision risk, due to its size and the way it migrates.

Habitat loss. This is not the case.

***Conclusions.* Negligible impact risk.**

Pernis apivorus

General aspects. Species identified in the area in passage, as isolated specimens.

Displacement and barrier effect. Potentially moderate barrier effect.

Potential collision risk. Moderate collision risk due the size of the species.

No. of the birds with real collision risk / period (in passage)*:* 0.00158

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Habitat loss. This is not the case.

***Conclusions.* Limited risk of impact.**

Milvus migrans

General aspects. Species which was not identified in the analyzed area, but which appears in the Standard Data Form of ROSPA Babadag Forest.

Displacement and barrier effect. The barrier effect is insignificant, as the species migrates as isolated specimens, at altitude and because of the fact that the species was not observed in the area of the site.

Potential collision risk. Potential moderate collision risk due to the fact the species was only occasionally observed.

Habitat loss. This is not the case.

***Conclusions.* Negligible risk.**

Tadorna ferruginea

General aspects. Seabirds species. It was not identified in the area. It is mentioned in the Standard Data Form of ROSPA Babadag Forest.

Displacement and barrier effect. Moderate barrier effect, due to the way in which they migrate.

Potential collision risk. Potential moderate collision risk.

Habitat loss. This is not the case. According to scientific literature (Munteanu D. 2009 „Vulnerable and endangered birds in Romania"):

- „**Habitat.** Sweetwater lakes or brackish water (seaside lagoons), sometimes larger rivers (it was observed nesting on the taller banks of the Danube), in areas with tall, abrupt banks….."
- „ Nests in cavities situated in the tall banks of lakes or (?) of the Danube"

According to scientific literature (Ciochia V. 1992 „Nesting birds in Romania"):

- „It is a summer guest on the Black Sea coasts, and in lagoon areas, having also been observed in the Danube Delta"

***Conclusions.* Species with a negligible risk. Its presence in the area is highly unlikely.**

Tyto alba

General aspects. Night raptor species that is mentioned in the Standard Data Form of ROSPA Babadag Forest. It was not identified during monitoring in the studied area.

Displacement and barrier effect. This is not the case.

Potential collision risk. Potential moderate collision risk, due to the size of the species.

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Habitat loss. Habitat loss at moderate risk, due to the fact that the species hunts in open habitats with scrub vegetation, as well as in forest edge.

***Conclusions.* Species with a limited impact risk**.

Table 41. The impact matrix for the target species - potentially affected:

Species	**Potential impact** - *based on information regarding the biology and ecology of those species*			**Conclusion on potential impact** *related with the presence and number of individuals*	**Mitigation measures**	**IUCN Red List**	**Red Book (2005)**
	Habitat displacement (direct and indirect)	Birds strike/ collision	Barrier effect				
Accipiter brevipes					*Not necessary*	LC	VU
Accipiter gentilis					*Not necessary*	LC	-
Accipiter nisus					*Not necessary*	LC	-
Anthus campestris					*Habitat loss mitigations*	LC	-
Aquila heliaca					*Not necessary*	VU	CR
Aquila pomarina					*Habitat loss mitigations Nesting habitat protection Collision risk management*	LC	VU
Asio flammeus					*Habitat loss mitigations*	LC	VU
Burhinus oedicnemus					*Not necessary*	LC	EN
Buteo buteo					*Habitat loss mitigations Nesting habitat protection Collision risk management*	LC	-
Buteo lagopus					*Not necessary*	LC	-
Buteo rufinus					*Habitat loss mitigations Nesting habitat protection Collision risk management*	LC	VU
Calandrella brachydactyla					*Habitat loss mitigations*	LC	-
Ciconia ciconia					*Not necessary*	LC	VU
Ciconia nigra					*Not necessary*	LC	VU
Circaetus gallicus					*Not necessary*	LC	VU
Circus aeruginosus					*Not necessary*	LC	-
Circus cyaneus					*Not necessary*	LC	-
Circus macrourus					*Not necessary*	NT	EN
Circus pygargus					*Not necessary*	LC	EN
Emberiza hortulana					*Habitat loss mitigations Nesting habitat protection*	LC	-
Falco tinnunculus					*Habitat loss mitigations Nesting habitat protection*	LC	-
Falco vespertinus					*Habitat loss mitigations Nesting habitat protection*	NT	VU
Haliaeetus albicilla					*Not necessary*	LC	CR
Hieraaetus pennatus					*Habitat loss mitigations Nesting habitat protection Collision risk management*	LC	CR
Melanocorypha calandra					*Habitat loss mitigations*	LC	-
Merops apiaster					*Not necessary*	LC	-
Miliaria calandra					*Habitat loss mitigations Nesting habitat protection*	LC	-
Pandion haliaetus					*Not necessary*	LC	VU

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Pelecanus crispus					*Not necessary*	VU	CR
Pelecanus onocrotalus					*Not necessary*	LC	VU
Pernis apivorus					*Not necessary*	LC	VU
Milvus migrans					*Not necessary*	LC	-
Tadorna ferruginea					*Not necessary*	LC	CR
Tyto alba					*Not necessary*	LC	VU

Legend

- Vulnerable (VU)
- Near threatened (NT)
- Least concern (LC)
- Critically endangered (CR)
- Endangered (EN)

	evidence of a substantial risk of impact (very high)
	evidence or indication of risk or impact (high)
	potential risk of impact (moderate)
	small or non-significant risk of impact, but still to be considered in the assessment
	this is not the case

Comments on assessment impact analysis on target species

From the species considered as target species affected, the following situation can be found, if the data is analyzed overall:

- *Habitat loss* is the most important risk factor - 10 species are at high risk of loss of habitat, and 7 at moderate risk. 17 species are not vulnerable in this respect.

- *The collision risk* is a moderate one overall. Due to the effectives recorded, in the area, 2 species are at high risk of collision and 23 at moderate risk of collision. 9 species present an insignificant collision risk.

Using the calculation method for determination of the theoretical risk of collision of the birds with wind turbines (according to SNH guide), it was calculated for the species found in passage (migratory): number of birds passing through risk window, probability of collision and actual collision risk, and for the resident species, the followings were calculated: the number of birds occupying the volume swept by rotors of wind turbines and also the collision probability and actual collision risk in case of these species. Main conclusion that emerges from calculation of collision risk is that the values of real risk collision for monitored period are subunitary and that highlights the fact that in the case of large bird species, appreciated initially with high risk grade, collision with wind turbine blades is less probable.

- *Displacement and barrier effect*. The barrier effect is the least important of the three risk factors for this group of species, because no large numbered flocks were recorded. The only flocks

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observed were poorly represented in terms of numbers of specimens, crossing the area studied during the migration period, at great heights. No species recorded a high risk barrier effect, 19 species recorded a moderate risk, 6 species an insignificant risk while for 9 species this risk factor does not appear.

Final Conclusion. **The most important risk factor for target species affected is the permanent or temporary loss of habitat following the installation of the wind turbines and the construction of the access roads network**. Please note that most species of Passeriformes, Coraciiformes, Falconidae are affected only during the construction of the wind farm, as they re-populate the affected areas after the construction work ceases and human presence in the area is reduced.

During the operation of the wind farm there shall be no impact over the habitats, there being no polluting emissions due to the technology employed. Even more, developing the wind farm brings the following benefits for biodiversity in the area:

- **Eliminating fire hazard** (via the practice of setting fire to stubble) on the wind farm surface, offers additional protection for species in the terrestrial avifauna and fauna which utilize the area for feeding.
- **Forbidding hunting within the wind farm perimeter, which currently is part of a hunting area.**
- **Forbidding aerial pesticide treatments** will significantly reduce the possibility that chemicals reach additional land surfaces and affect local flora and fauna outside the agricultural cultures (e.g. Steppe areas and forested areas).
- the area will be **monitored** by biologists or ecologists, such that the possibility of affecting biodiversity is significantly reduced through fast signaling, and diminishing potential negative impacts.

Taking into account the mitigation measures proposed in Chapter 7 and the information regarding the presence of those species and of their effectives resulting the followings:

- an insignificant impact for the mostly of the target species initially considered to be affected and who present non significant effectives in the studied area in comparison with the populations estimated at national or global level;

- a moderate impact for the target species considered to be affected and for which the mitigation measures are important in maintaining the effectives present in the area before the project implementation.

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Target species not affected

Upupa epops

General aspects. Species present over the entire area analyzed, as isolated specimens or in small groups. It feeds in open areas and edges of woods, as well as areas with shrub habitats, pastures, agricultural areas.

Displacement and barrier effect. This is not the case.

Potential collision risk. Negligible collision risk, due to the ecology of the species.

Habitat loss. Insignificant risk, due to the changes of the grassland habitats

***Conclusions.* Species with an insignificant impact risk.**

Phoenicurus ochruros

General aspects. Species present in areas with a shrub vegetation and rocky areas, or on roadsides, but also in anthropogenic areas.

Displacement and barrier effect. This is not the case.

Collision risk . Insignificant collision risk.

Habitat loss. Insignificant habitat loss. Construction of access roads to the wind turbines may be a potential contributory factor.

***Conclusions.* Species with an insignificant impact risk.**

Phoenicurus phoenicurus

General aspects. Species with a similar ecology to the previous one, present in the area as isolated specimens.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. Insignificant loss of habitat.

***Conclusions.* Species with an insignificant impact risk.**

Strix aluco

General aspects. Forest species which can occasionally hunt in areas near the edges of woods, in areas with bushes.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

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Habitat loss. Insignificant loss of habitat, only due to the construction of access roads near the forest edge.

***Conclusions.* Species with an insignificant impact risk.**

Lullula arborea

General aspects. Species characteristic to forested areas, but also to habitats with shrub vegetation, grass or pastures.

Displacement and barrier effect. This is not the case

Potential collision risk. Insignificant collision risk.

Habitat loss. Insignificant loss of habitat, mainly due to the access roads to the turbines.

***Conclusions.* Species with an insignificant impact risk.**

Lanius collurio

General aspects. Species present in the area at the edge of Babadag forest, in areas with shrubs.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. Potential loss of habitat with limited impact.

***Conclusions*. Species with a limited impact risk. Compensation/mitigation measures are recommended (see following sections).**

Lanius minor

General aspects. Species present in the area at the edge of Babadag forest, in areas with shrubs.

Displacement and barrier effect. This is not the case.

Potential collision risk. Reduced collision risk.

Displacement and barrier effect. This is not the case.

Habitat loss. Potential loss of habitat with limited impact.

***Conclusions.* Species with a limited impact risk. Compensation/mitigation measures are recommended (see following sections).**

Passer hispaniolensis

General aspects. Species present in areas with shrubs, at the edge of woods, as well as in the vicinity of settlements.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

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Habitat loss. Insignificant loss of habitat.

***Conclusions.* Species with an insignificant impact risk**

Phylloscopus collybita

General aspects. Forest species present at the edge of Babadag forest.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk.**

Phylloscopus sibilatrix

General aspects. Forest species, with a similar ecology to that of the previous species. Present at the edge of Babadag forest.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk.**

Picus canus

General aspects. Forest species, present in Babadag forest.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk.**

Picus viridis

General aspects. Forest species, present in Babadag forest.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk.**

Sitta europaea

General aspects. Forest species, present in Babadag forest.

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Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk.**

Sturnus roseus

General aspects. Species present in areas with a herbaceous or shrubs vegetation. It can feed in areas with a herbaceous vegetation or in pastures. It was not observed during monitoring.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk.**

Sylvia nisoria

General aspects. Forest species, present in the ROSPA Babadag Forest.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk.**

Oenanthe pleschanka

General aspects. The species was not identified in the area during monitoring. Surfaces with rockery are extremely reduced in the area analyzed.

Displacement and barrier effect. This is not the case.

Potential collision risk. Negligible collision risk, comparable to other species of the genus.

Habitat loss. Rockery areas are too limited for the species. The potential further loss of rockery areas will not affect the species, never identified in site.

***Conclusions.* Species with a negligible risk of impact.**

Oriolus oriolus

General aspects. Forest species, present in Babadag Forest.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

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Conclusions. **Species with an insignificant impact risk.**

Otus scops

General aspects. Forest species, present in Babadag Forest.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

Conclusions. **Species with an insignificant impact risk.**

Panurus biarmicus

General aspects. Migratory species characteristic to wetlands. It was not identified in the area during monitoring.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

Conclusions. **Species with an insignificant impact risk.**

Motacilla flava

General aspects. Species characteristic to wetlands, present in the area only during migrations.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

Conclusions. **Species with an insignificant impact risk.**

Muscicapa striata

General aspects. Forest species, present in Babadag Forest.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

Conclusions. **Species with an insignificant impact risk.**

Jynx torquilla

General aspects. Forest species, present in Babadag Forest.

Displacement and barrier effect. This is not the case.

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Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant collision risk.**

Motacilla alba

General aspects. Species characteristic to wetlands, present in the area only during migration.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant collision risk.**

Aegithalos caudatus

General aspects. Forest species. It was not identified in the studied area.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions*. Species with an insignificant collision risk.**

Athene noctua

General aspects. Species characteristic especially to anthropogenic habitats. It uses terrains at the edge of settlements for feeding.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk.**

Carduelis cannabina

General aspects. Species characteristic to shrub habitats.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk.**

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Carduelis carduelis

General aspects. Species characteristic shrub habitats, anthropogenic areas with weedy vegetation.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk.**

Carduelis chloris

General aspects. Species characteristic habitats with shrubs, as well as forested areas.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk.**

Carduelis flammea

General aspects. Winter guest, species characteristic to shrub habitats

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk.**

Carduelis spinus

General aspects. Winter guest, species characteristic to shrub habitats

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions*. Species with an insignificant impact risk.**

Coccothraustes coccothraustes

General aspects. The species was not identified in the area during monitoring.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

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***Conclusions*. Species with an insignificant impact risk.**

Coracias garrulus

General aspects. Species characteristic to shrub habitats, forest edges and banks of loess. It is found in such habitats located at the limit of Babadag Forest and in the ravine area from the proximity of the villages.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions*. Species with an insignificant impact risk.**

Corvus corax

General aspects. The species was not identified in the area during monitoring.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions*. Species with an insignificant impact risk.**

Dendrocopos medius

General aspects. Forest species, present in Babadag Forest.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk.**

Dryocopus martius

General aspects. Forest species, present in Babadag Forest. It was not identified in the area during monitoring.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk.**

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Erithacus rubecula

General aspects. Forest species, present in Babadag Forest.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions*. Species with an insignificant impact risk.**

Ficedula parva

General aspects. Forest species, present in Babadag Forest.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions*. Species with an insignificant impact risk.**

Falco cherrug

General aspects. The species was not identified in the area during monitoring. Species mentioned in the Standard Natura 2000 Data Forms for the ROSPA Babadag Forest.

Displacement and barrier effect. Insignificant barrier effect.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk**

Falco peregrinus

General aspects. The species was not identified during monitoring. Nesting pairs are found only in the Oriental and Occidental Carpathians. They can only appear in the area in passage. Species mentioned in the Standard Natura 2000 Data Forms for the ROSPA Babadag Forest.

Displacement and barrier effect. Insignificant barrier effect.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions*. Species with an insignificant impact risk**

Falco subbuteo

General aspects. Species found in forest, agricultural and wetland habitats, which was not observed within the site.

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Displacement and barrier effect. Insignificant barrier effect.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions*. Species with an insignificant impact risk.**

Comments on assessment impact analysis on target species not affected

By analyzing the data in a centralized manner, it is found that all species from this section presents an insignificant risk or no risk at all in terms of loss of habitat. All species - 40 - presents a low, insignificant risk of collision with the wind turbines. Regarding the barrier effect, no analyzed species presents a significant risk.

Table 42. The impact matrix for the target species - not affected:

Species	**Potential impact** - *based on information regarding the biology and ecology of those species*			**Conclusion on potential impact** *related with the presence and number of individuals*	**IUCN Red List**	**Red Book (2005)**
	Habitat displacement (direct and indirect)	Birds strike/ collision	Barrier effect			
Upupa epops					LC	VU
Passer hispaniolensis					LC	-
Phoenicurus ochruros					LC	-
Phoenicurus phoenicurus					LC	-
Strix aluco					LC	-
Lanius collurio					LC	-
Lanius minor					LC	-
Lullula arborea					LC	-
Phylloscopus collybita					LC	-
Phylloscopus sibilatrix					LC	-
Picus canus					LC	-
Picus viridis					LC	-
Sitta europaea					LC	-
Sturnus roseus					LC	VU
Sylvia nisoria					LC	-
Oenanthe pleschanka					LC	VU
Oriolus oriolus					LC	-
Otus scops					LC	-
Panurus biarmicus					LC	-
Motacilla flava					LC	-
Muscicapa striata					LC	-
Jynx torquilla					LC	EN
Motacilla alba					LC	-
Aegithalos caudatus					LC	-

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Athene noctua					LC	-
Carduelis cannabina					LC	-
Carduelis carduelis					LC	-
Carduelis chloris					LC	-
Carduelis flammea					LC	-
Carduelis spinus					LC	-
Coccothraustes coccothraustes					LC	-
Coracias garrulus					NT	-
Corvus corax					LC	EN
Dendrocopos medius					LC	-
Dryocopus martius					LC	-
Erithacus rubecula					LC	-
Ficedula parva					LC	-
Falco cherrug					EN	CR
Falco peregrines					LC	EN
Falco subbuteo					LC	-

Legend

- Vulnerable (VU)
- Near threatened (NT)
- Least concern (LC)
- Critically endangered (CR)
- Endangered (EN)

	evidence of a substantial risk of impact (very high)
	evidence or indication of risk or impact (high)
	potential risk of impact (moderate)
	small or non-significant risk of impact, but still to be considered in the assessment
	not the case

6.1.3. Assessment of the impacts on secondary species

6.1.3.1. Secondary Species assessed

For each species, a description of the impact was conducted, with the following structure: general aspects, displacement and barrier effect, collision risk (based on the guide drafted by Scottish Natural Heritage), habitat loss and conclusions.

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6.1.3.1.a. Secondary species affected assessed

Alauda arvensis

General aspects. Species characteristic to habitats occupied by herbaceous vegetation and to agricultural lands.

Displacement and barrier effect. This is not the case

Potential collision risk. Insignificant collision risk.

Habitat loss. The species is at high risk of habitat loss.

Conclusions. **Species with a potential moderate impact risk.**

Ardea cinerea

General aspects. Species characteristic to wetlands, only present in the area during migrations.

Displacement and barrier effect. This is not the case.

Potential collision risk. Potential moderate collision risk.

No. of the birds with real collision risk / period (in passage)*:* 0.00576

Habitat loss. This is not the case.

***Conclusions*. Species with an insignificant impact risk.**

Emberiza citrinella

General aspects. Species present in the area, it used farmlands and pastures as feeding ground.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. Loss of habitat is at high risk, due to the ecology of the species.

***Conclusions.* Species with a potential moderate impact risk.**

Hirundo rustica

General aspects. Gregarious species present in open areas, in small groups.

Displacement and barrier effect. Insignificant risk as a result of the barrier effect.

Potential collision risk. Potential moderate collision risk, as a result of how they migrate.

Habitat loss. This is not the case.

***Conclusions*. Species with an insignificant impact risk.**

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Perdix perdix

General aspects. Species characteristic to agricultural areas and to areas with tall grasses or with shrubs, forest edge.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. Potentially moderate habitat loss, especially over the course of the construction work.

***Conclusions*. Species with an insignificant impact risk.**

Riparia riparia

General aspects. Species that nests in high banks of earth and feeds in the monitored area (grasslands, arable land).

Displacement and barrier effect. Insignificant barrier effect.

Potential collision risk. Potential moderate collision risk, as a result of the fly patterns.

Habitat loss. This is not the case.

***Conclusions*. Species with an insignificant impact risk.**

Sturnus vulgaris

General aspects. Species present in anthropogenic areas and which also nests in banks of earth.

Displacement and barrier effect. This is not the case.

Potential collision risk. Potential moderate collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk.**

Table 43. The impact matrix for the affected secondary species:

Secondary species affected	**Potential impact -** *based on information regarding the biology and ecology of those species*			**Conclusion on potential impact** *related with the presence and number of individuals*	**Mitigation measures**	**IUCN Red List**	**Red Book 2005**
	Habitat displacement (direct and indirect)	Birds strike/ collision	Barrier effect				
Alauda arvensis					*Habitat loss mitigations*	LC	-
Ardea cinerea					*Not necessary*	LC	-
Emberiza citrinella					*Habitat loss mitigations*	LC	-
Hirundo rustica					*Not necessary*	LC	-
Perdix perdix					*Not necessary*	LC	-
Riparia riparia					*Not necessary*	LC	-
Sturnus vulgaris					*Not necessary*	LC	-

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Legend

- Vulnerable (VU)
- Near threatened (NT)
- Least concern (LC)
- Critically endangered (CR)
- Endangered (EN)

	evidence of a substantial risk of impact (very high)
	evidence or indication of risk or impact (high)
	potential risk of impact (moderate)
	small or non-significant risk of impact, but still to be considered in the assessment
	not the case

6.1.3.1.b. Secondary species not-affected assessed

Columba palumbus

General aspects. Forest species, present in the Standard Data Form of ROSPA Babadag Forest.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions*. Species with an insignificant impact risk.**

Corvus cornix

General aspects. Antropophillic species, present both at the limit of localities and on agricultural land or in grasslands or shrub areas. During the assembly period of the wind farm, the effectives are likely to grow, due to the attraction of this species towards food debris.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. Insignificant risk of habitat loss.

***Conclusions.* Species with an insignificant impact risk.**

Corvus frugilegus

General aspects. Antropophillic species, present both at the limit of localities and on agricultural land or in grasslands or shrub areas. During the assembly period of the wind farm, the effectives are likely to grow, due to the attraction of this species towards food debris.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. Insignificant risk of habitat loss.

***Conclusions*. Species with an insignificant impact risk.**

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Corvus monedula

General aspects. Antropophillic species, present both at the limit of localities and on agricultural terrains.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. Insignificant risk of habitat loss.

***Conclusions*. Species with an insignificant impact risk.**

Cuculus canorus

General aspects. Forest species.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk.**

Dendrocopos major

General aspects. Forest species, present in Babadag Forest.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions*. Species with an insignificant impact risk.**

Fringilla coelebs

General aspects. Forest species, present in Babadag Forest.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions*. Species with an insignificant impact risk.**

Galerida cristata

General aspects. Species characteristic of anthropogenic areas with agricultural habitats and to areas with herbaceous vegetation.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

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Habitat loss. Insignificant risk of habitat loss.

***Conclusions.* Species with an insignificant impact risk.**

Garrulus glandarius

General aspects. Forest species, present in Babadag Forest.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk.**

Hippolais icterina

General aspects. Forest species, present in Babadag Forest.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. Insignificant risk of habitat loss.

***Conclusions*. Species with an insignificant impact risk.**

Lanius senator

General aspects. Species characteristic to shrub areas. It was not identified during the monitoring period.

Displacement and barrier effect: This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. Potential loss of habitat with limited impact.

***Conclusions.* Species with an insignificant impact risk.**

Lanius excubitor

General aspects. Migratory species, present in the shrub areas during the winter.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. Potential loss of habitat with limited impact.

Conclusions. Species with a limited impact risk.

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Oenanthe isabellina

General aspects. Species characteristic to areas with open rockeries, more rarely in areas with shrubs or in steppe grasslands.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. Rockery areas are too limited for the species. The potential further loss of rockery areas will not affect the species.

***Conclusions.* Species with an insignificant impact risk.**

Oenanthe oenanthe

General aspects. Species characteristic to areas with open rockeries, more rarely in areas with shrubs or in grasslands.

*Displacement and barrier effec*t. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. Rockery areas are too limited for the species. The potential further loss of rockery areas will not affect the species.

***Conclusions*. Species with an insignificant impact risk.**

Parus lugubris

General aspects. Forest species, present in standard data form ROSPA Babadag Forest.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk.**

Passer domesticus

General aspects. Antropophillic species, present at the edge of localities.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk**

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Passer montanus

General aspects. Species present in shrub areas, on the side of forests, agricultural lands and near settlements.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions*. Species with an insignificant impact risk**

Phalacrocorax carbo

General aspects. Species characteristic to wetlands, present only occasionally, during migration.

Displacement and barrier effect. Insignificant barrier effect.

Potential collision risk. Insignificant collision risk.

No. of the birds with real collision risk / period (in passage)*:* 0.01683

Habitat loss. Insignificant loss of habitat.

***Conclusions.* Species with an insignificant impact risk**

Phasianus colchicus

General aspects. Introduced species, present in areas with bushes, orchards, or in forest edge, as well as in agricultural lands.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. Insignificant loss of habitat.

***Conclusions.* Species with an insignificant impact risk**

Pica pica

General aspects. Antropophillic species, also present in areas with shrubs or on the side of forest.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk**

Saxicola torquata

General aspects. Species characteristic to shrub areas.

Displacement and barrier effect. This is not the case.

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Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk**

Streptopelia decaocto

General aspects. Species present in localities, anthropogenic areas.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk**

Streptopelia turtur

General aspects. Forest species that can reach agricultural lands, present in Babadag Forest

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk**

Sylvia atricapilla

General aspects. Forest species, present in Babadag Forest.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk.**

Sylvia curruca

General aspects. Forest species, present in Babadag Forest.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk**

Turdus merula

General aspects. Forest species, present in Babadag Forest.

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Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk**

Turdus philomelos

General aspects. Forest species, present in Babadag Forest.

Displacement and barrier effect. This is not the case.

Potential collision risk. Insignificant collision risk.

Habitat loss. This is not the case.

***Conclusions.* Species with an insignificant impact risk.**

Table 44. The impact matrix for the secondary species not affected:

Secondary species not affected	**Potential impact -** *based on information regarding the biology and ecology of those species*			**Conclusion on potential impact** *related with the presence and number of individuals*	**IUCN Red List**	**Red Book 2005**
	Habitat displacement (direct and indirect)	Birds strike/ collision	Barrier effect			
Columba palumbus					LC	-
Corvus cornix					LC	-
Corvus frugilegus					LC	-
Corvus monedula					LC	-
Cuculus canorus					LC	-
Dendrocopos major					LC	-
Fringilla coelebs					LC	-
Galerida cristata					LC	-
Garrulus glandarius					LC	-
Hippolais icterina					LC	-
Lanius senator					LC	-
Lanius excubitor					LC	-
Oenanthe isabellina					LC	VU
Oenanthe oenanthe					LC	-
Parus lugubris					LC	-
Passer domesticus					LC	-
Passer montanus					LC	-
Phalacrocorax carbo					LC	-
Phasianus colchicus					LC	-
Pica pica					LC	-
Saxicola torquata					LC	-
Streptopelia decaocto					LC	-

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Streptopelia turtur					LC	VU
Sylvia atricapilla					LC	-
Sylvia curruca					LC	-
Turdus merula					LC	-
Turdus philomelos					LC	-

Legend

- Vulnerable (VU)
- Near threatened (NT)
- Least concern (LC)
- Critically endangered (CR)
- Endangered (EN)

	evidence of a substantial risk of impact (very high)
	evidence or indication of risk or impact (high)
	potential risk of impact (moderate)
	small or non-significant risk of impact, but still to be considered in the assessment
	not the case

Comments on assessment impact analysis on secondary species

By analyzing the secondary species, it was found that the most important risk factor is represented by the loss of habitat.

Risk of collision. From the secondary species category, only 4 show a potential moderate collision risk.

Regarding the loss of habitat due to the construction of the wind farm, 2 species are at high risk from this point of view, and 20 species are not affected in any way by habitat loss.

The barrier effect is totally insignificant in the case of these species.

6.2. Bats

The number of Chiroptera species present in the area being monitored was reduced. Only 8 species were identified after the monitoring conducted between 2006 - 2013. Regarding the impact on these species caused by the construction of the future wind farm, it is a differentiated one, depending on the ecology of each individual species.

6.2.1. List of target species potentially affected

7 species of Chiroptera were identified in the studied area. The target species list contains the 7 species identified in the area analyzed, to which the following are added:

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✓*Rhinolophus ferrumequinum* - species observed outside the studied area, during the survey trips, in mine galleries located at a distance of approx. 2.7 km from the wind farm analyzed;

✓*Myotis myotis si Pipistrellus nathusii* species potentially present in Babadag Forest and mentioned in bibliographic sources

Therefore, the list of target species includes

Species
Barbastella barbastellus
Eptesicus serotinus
Myotis daubentonii
Myotis myotis
Nyctalus leisleri
Nyctalus noctula
Pipistrellus nathusii
Pipistrellus pipistrellus
Plecotus auritus
Rhinolophus ferrumequinum

6.2.2. Assessment of the impacts on target species

The onsite visits from April-June 2013, with the purpose of identifying the bat species present in the analyzed area, have led to the following conclusions:

The results of the synecologic analysis in the case of data concerning the chiropters suggest a higher trophic offer of the ecotonal area from the edge of the forest. Also, we consider that the ecotonal area presents micro-climate and habitat conditions favorable to the bats. Inside of the perimeter of the future wind farm, the trophic offer for chiropters is lower, and the distance towards day shelters is relatively high. This fact is correlated with a low number of species recorded and subsequently identified.

6.2.2.1. Target Species assessed

Barbastella barbastellus

General aspects. Forest species, present in oak forests. Feeding begins about 1 - 2 hours after sunset, in rapid flight over the trees. They do not hunt around light sources.

Loss of hunting habitats. This is not the case, as it is a forest species and only flies in areas with vegetation consisting of trees.

Loss of roost sites. This is not the case. The forest area will not be affected.

Potential collision risk. The risk of impact is insignificant, because the species hunts mainly in the forest area and avoids artificial light sources.

***Conclusions.* Species with an insignificant impact risk.**

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Eptesicus serotinus

General aspects. Forest and antropophile species, present near settlements. It hunts at heights of 6-10 m, flying in wide circles, with a heavy flight. It prefers edges of woods, agricultural land at the limit of settlements, often around light sources.

Loss of hunting habitats. Potential risk, moderate, due to how they feed

Loss of roost sites. This is not the case. The sheltering habitats will not be affected

Potential collision risk. Potential moderate risk, due to how they hunt.

***Conclusions.* Potential moderate risk species.**

Myotis daubentonii

General aspects. Forest species, usually found near wetlands, but not only there. It takes shelter both in buildings and the old tree hollows, or in nests of *Riparia riparia*. It hunts about 2 hours after sunset, at low heights – 5-20 cm from the soil or surface the water, or around trees.

Loss of hunting habitats. Potential moderate risk, due to how they feed

Loss of roost sites. This is not the case. The sheltering habitats will not be affected

Potential collision risk. Insignificant collision risk, due to the way it feeds.

***Conclusions.* Species with a moderate risk of impact, due to the damaging of its feeding habitat.**

Myotis myotis

General aspects. Antropophile species, present especially in the vicinity of settlements. It hunts after dark, in meadows and pastures, areas with bushes, plantations of deciduous or mixed forests. It flies 0.5 - 10 m above the ground, all through the night, reaching 10 km from the shelter.

Loss of hunting habitats. Potential risk, moderate, due to how they feed

Loss of roost sites. This is not the case. The sheltering habitats will not be affected

Potential collision risk. Due to the ecology of the species and because of the presence in the vicinity of settlements, the collision risk for this species is a potential moderate one.

***Conclusions.* Species with a negligible impact as it was never detected in the area.**

Nyctalus leisleri

General aspects. Forest species that can also be found in settlements. It hunts less than an hour after sunset, at the edge of woods or in open areas, and can also be found around light sources. Its flight is fast, at a height of 15 m above the ground.

Loss of hunting habitats. Potential moderate risk, due to how they feed.

Loss of roost sites. This is not the case. The sheltering habitats will not be affected.

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Potential collision risk. Potential moderate collision risk due to the ecology of the species.

Conclusions. **Species with a potential moderate risk of impact.**

Nyctalus noctula

General aspects. Mainly a forest species, that can also be found in settlements. In forests, it can usually be found at the edge, and prefers tree hollows as shelter (oak, poplar), at about 20 m above the ground. They hunt in groups, over forests or grasslands, even before sunset, and at altitudes between 10 and 40 m.

Loss of hunting habitats. Potential risk, moderate, due to how they feed.

Loss of roost sites. This is not the case. The sheltering habitats will not be affected.

Potential collision risk. High collision risk, due to the ecology of the species.

Conclusions. **Species with a potential moderate risk of impact**

Pipistrellus nathusii

General aspects. It is mainly a forest species, which usually avoids built-up areas. It takes shelter in hollows or under the bark of old trees, and the feeding flight is fast, beginning approximately one hour after sunset, at a height of 4 -15 m.

Loss of hunting habitats. Insignificant risk

Loss of roost sites. This is not the case. The sheltering habitats will not be affected.

Potential collision risk. Given its flight height, the risk of collision is a potential moderate one.

Conclusions. **Species with a negligible impact as it was never detected in the area.**

Pipistrellus pipistrellus

General aspects. Species present in both human settlements and in forests. It hunts immediately after sunset, in rapid flight, 5-10 m above the ground. It is frequently seen around light sources from settlements.

Loss of hunting habitats. Potential risk, moderate, due to how they feed.

Loss of roost sites. This is not the case. The sheltering habitats will not be affected.

Potential collision risk. Moderate collision risk.

Conclusions. **Species at a potential moderate risk.**

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Plecotus auritus

General aspects. Forest species, that can also appear in settlements. It takes shelter in hollows or rock fissures, as well as shelters of human origin. It hunts late after sunset, in rapid flight, at heights between 2-15 m.

Loss of *hunting habitats.* Insignificant risk

Loss of roost sites. This is not the case. The sheltering habitats will not be affected

Potential collision risk. Insignificant collision risk.

***Conclusions.* Species with an insignificant impact risk.**

Rhinolophus ferrumequinum

General aspects. Forest and karst species, that sometimes hunts distances of around 10 km from their shelter. They can be found at the edge of forests and in areas with grazed bushes, or at the edge of villages. Its feeding flight is at a 0.3 - 3 m distance from the ground.

Loss of *hunting habitats.* Insignificant risk. The grazing areas and grazing itself (activity which attracts insects that it feeds on) are only insignificantly affected by the emplacement of the wind farm.

Loss of roost sites. This is not the case. The sheltering habitats will not be affected

Potential collision risk. Insignificant collision risk, due to their flight altitudes, and due to the small number of specimens present in the region. During the feeding flight, the species flies below the turbine blades. Feeding habitats favorable for this species are found in the North of the site.

***Conclusions.* Species with an insignificant impact risk.**

Comments on assessment impact analysis on bat species

By analyzing the situation of the bat species present in the monitored area in terms of the collision risk, is was concluded that only one species - *Nyctalus noctula* - is characterized by a high collision risk, 5 register a potential moderate collision risk and 4 an insignificant risk. Regarding the loss of sheltering habitats, we mention that the built surfaces do not target karst areas, forested or residential areas, resulting that there is no impact on these. Regarding the hunting habitats, three species recorded an insignificant risk of loss of habitat, for 6 species the predicted impact is moderate, and for the species *Barbastella barbastellus*, given the ecological characteristics, the potential impact is absent. Loss of hunting habitat will develop over a limited period of time, corresponding to the wind farm construction period, and will primarily be the result of temporary interference with the agricultural ecosystems through the activities carried out during the construction: scraping, excavation, works on access roads and on wind turbine

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foundations (in agreement with EUROBATS 3). As was noted in previous chapters, these aspects notwithstanding, the site does not host heightened activity for the bat species in the studied area, given their concentration in the ecotone areas corresponding to the Babadag Forest edges.

Table 45. The impact matrix for the bats target species:

Target species	**Potential impact** - *based on information regarding the biology and ecology of those species*			**Conclusion on potential impact** *related with the presence and number of individuals*	**Mitigation measures**	**IUCN Red List**	**Red Book 2005**
	Loss of hunting habitats	**Loss of roost sites**	**Collision risk**				
Barbastella barbastellus					*Not necessary*	NT	VU
Eptesicus serotinus					*Habitat loss mitigations Collision risk management*	LC	VU
Myotis daubentonii					*Habitat loss mitigations Collision risk management*	LC	CR
Myotis myotis					*Not necessary*	LC	EN
Nyctalus leisleri					*Habitat loss mitigations Collision risk management*	LC	EN
Nyctalus noctula					*Habitat loss mitigations Collision risk management*	LC	-
Pipistrellus nathusii					*Not necessary*	LC	EN
Pipistrellus pipistrellus					*Habitat loss mitigations Collision risk management*	LC	-
Plecotus auritus					*Not necessary*	LC	VU
Rhinolophus ferrumequinum					*Not necessary*	LC	VU

Legend

- Vulnerable (VU)
- Near threatened (NT)
- Least concern (LC)
- Critically endangered (CR)
- Endangered (EN)

	evidence of a substantial risk of impact (very high)
	evidence or indication of risk or impact (high)
	potential risk of impact (moderate)
	small or non-significant risk of impact, but still to be considered in the assessment
	not the case

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6.3. The cumulative impact analysis

The elaborator is aware of the presence of a structure with the same functionality (making use of wind power) in the operational stage within the study area, which the elaborator takes into account together with the studied wind farm, in analyzing the cumulative impact. The wind farm ensemble thus consists of 53 wind turbines, erected on predominantly agricultural land.

General information about the TOTAL ELECTRIC (Enel) wind farm:

The wind farm with a total capacity of 27 MW consists of 11 turbines:

- 6 Vestas V80 2MW turbines
- 5 Vestas V90 3MW turbines

The turbines are located outside Topolog Village, Tulcea District (T43, P A276, T62, P 391, T 63, P 394, T81, P479, T67, P 431), in an area consisting of arable land and pastures, 137.48 ha in surface.

Of the 53 wind turbines which make up the wind power ensemble, 34 (64.2%) fall outside all protected areas, including Natura 2000 sites, and the rest of **19 (35.8%) turbines are located on Natura 2000 sites**, as follows:

- 18 turbines are located in the ROSCI0201 North Dobrogea Plateau (LU-03, LU-04, LU-05, LU-06, LU-07, LU-08, LU-09, LU-10, LU-11, TO 01, ME – 08; E1; E5; E6; E7; TE1; TE2; TE3; TE4);
- One turbine is situated in ROSCI0201 North Dobrogea Plateau and ROSPA0091 Babadag Forest (ME – 08).

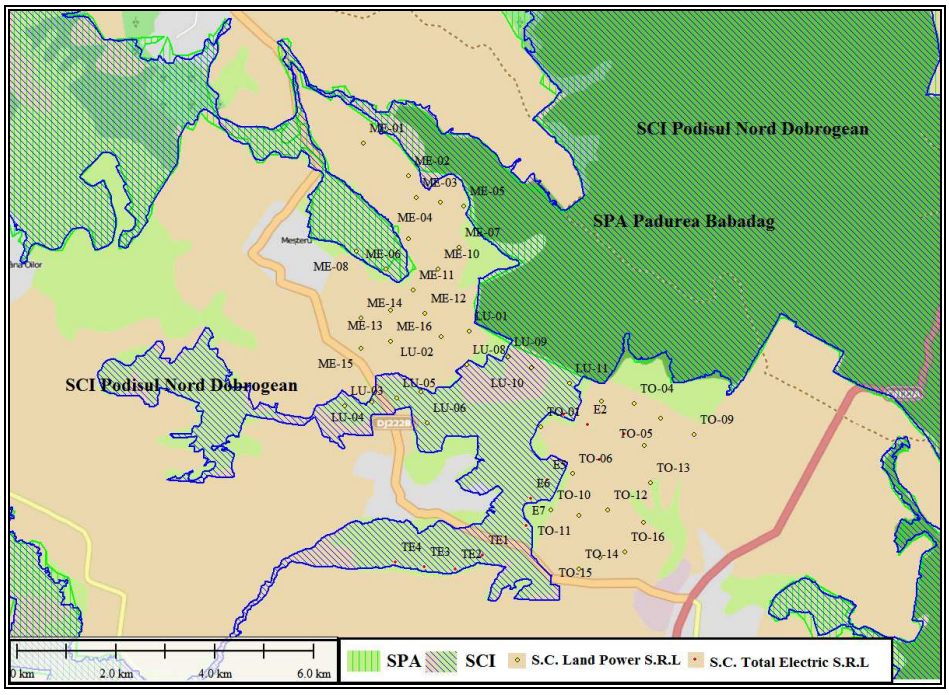

Figure 66. *Approximate location of the wind farm ensemble in relation to Natura 2000 Protected Areas*

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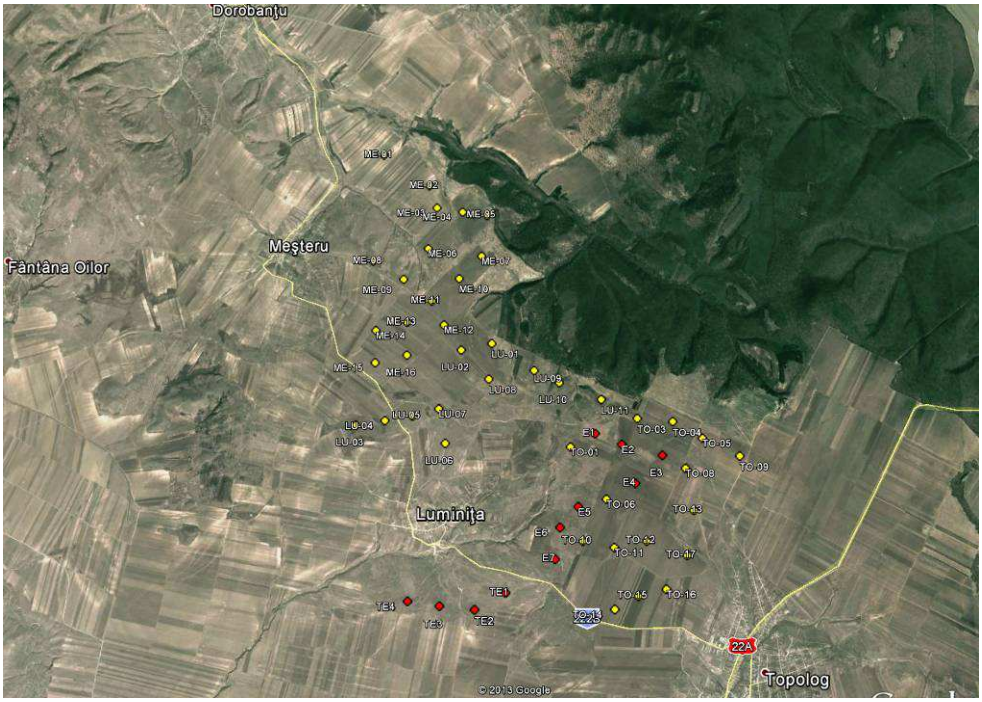

Figure 67. *Satellite image of the wind farms location*

Land use in the area under survey

Land use type	Total number turbines	Number within SCI	Number within SPA
Non-irrigated arable land	34	0	0
Pastures	19	19	1

The impact mitigation measures for the anayzed ensemble notwithstanding, we make not of the fact that both wind farms underwent or shall undergo an environmental protection procedure, and the legislation stipulates measures to be taken for each life stage of the farm. Complying with the measures for each farm in part will contribute to a considerable reduction of both the local-level impact for each farm, and of the impact of the entire wind farm ensemble.

With regard to **residual impact** over species and habitates within areas of Community interest, we note that this consists of the permanent loss of some parts of habitats through changing the destination of the land in those areas permanently affected by the construction of the wind power ensemnble (throughout the life time of the wind power ensemble).

The built surface of the wind power ensemble constitute approximately 0,00006% of SPA Babadag Forest, and respectively approximately 0,003% of SCI North Dobrogea Plateau, which represent extremely small areas compared to the areas of the protected territories.

In addtion, uncultivated land within the studied area are visibly affected by overgrazing, with effects on both local flora and fauna, and upon the construction of the wind power ensemble

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and consequent reduction in grazing, it is even expected that the state of the local ecosystems improves.

It is important to note at the same time that constructing the wind power ensemble causes a reduction in the surface of the initial habitats, but wind farms are known to have minimal effects on natural habitats and even less so on antrophic ones, as a result of the fact that the surface affected permanently through the erection of the necessary buildings is extremely small compared to the total area of the wind farms. This type of development is based on using high altitudes (the wind turbine operation radius) and does not require ample construction work at the ground level, which could have an effect on existing habitats.

Building the access road network within the perimeter of the wind farm ensemble shall mainly consist of improving existing roads, but also building new roads, which does involve a significant cumulative impact, given that existing populations will be able to transit the area without encountering obstacles.

With regard to the temporary dislocation of birds from the ensemble perimeter, we note that there will be no cumulative impact, because the entire area under survey as well as adjacent areas have similar habitat conditions, such that the fauna is able to temporary relocate to areas where no wind turbine building works are being carried out, and return to the initial areas following the completion of the works. Furthermore, owing to the phasing of the execution, the land under construction is bound to be reduced and temporary, such that the local fauna can even make use of areas within the future wind farm perimeter.

During the construction of the components projected for the wind power ensemble, the effects of noise over biodiversity is limited to the effect over the fauna. As such, noise will appear primarily due to the operation of the equipment necessary for the building works, but also due to other activities at the construction site, and will determine the temporary relocation of fauna to neighboring areas with similar habitat conditions. The departure of fauna from the construction sites is primarily due to the physical presence of new elements in the area.

Owing to the phased construction, it is expected that the effects of noise will not manifest themselves across the wind farm area, but locally, at the level of the intervention sites and of the main access roads. A direct short-term effect on species in the feedind area is expected, following which, upon the completion of the building works, the temporarily occupied land shall return to the initial circuit, such that the fauna can reutilize the corresponding area.

We note that Vantage Points observations over the studied area carried out in spring 2013 included the site of the Total Electric wind farm as well. Therefore, the data collected and annexed to the study (Appendix 2) obtained for the spring season, which coincides with the period of

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operation of the wind farm, reveals the fact that it did not serve as a barrier for either migrating birds or resident birds. Large aquatic species, in small numbers, crossed over the wind farm at high altitudes, much above the turbines, whereas migrating raptor species crossed the wind farm both above and through the turbines. Part of the raptor birds identified to be nesting and/or residing in the targeted area used the Total Electric wind farm area as a feeding area, during the spring 2013 observations period. Representatives of the *Buteo buteo*, *Buteo rufinus*, *Falco tinnunculus*, *Falco vespertinus* and *Circus aeruginosus* were recorded hovering or actively flying over the arable lands and pastures in the immediate vicinity of the turbines. In some cases (*Falco tinnunculus* and *Falco vespertinus*), individuals were recorded in passing between the blades of working wind turbines.

It is noteworthy that resident raptor species gradually adapted to the presence of wind turbines in the area, such that shortly after the completion of the construction works, they resumed using the area as a feeding area. In further stages of avifauna monitoring (fall 2013), observations on area usage within the Total Electric wind farm will continue.

Regarding the barrier effect of the wind power ensemble it is important to note that the studied area is located at the periphery of a major migration route. The wind power ensemble area is crossed by small numbers of birds during migration, which most likely deviated from the main migration route. This fact, along with the relatively small number of turbines, considerably diminishes the possibility of barrier effect occurrence.

An aspect revealed through Vantage Points observations is that all diurnal raptor species continued to use the Total Electric wind farm site as a feeding area, and no collisions with functioning wind farms were observed. Moreover, entities specialized in ornithological studies have not released information regarding bird collisions with the wind turbines in the studied area.

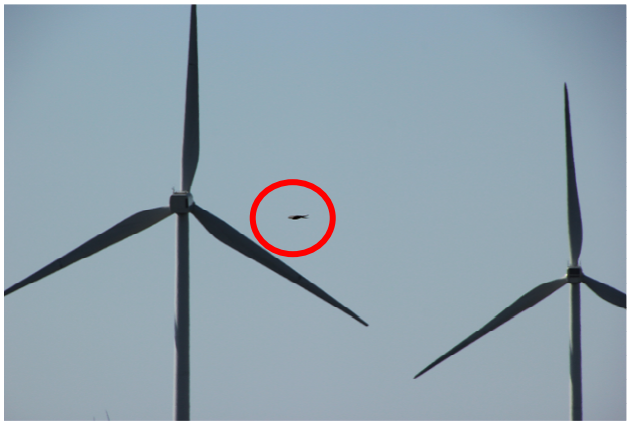

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Figure 68. Diurnal raptor birds using the Total Electric wind farm site as a feeding area

Studies elaborated throughuout time in countries implementing wind power production on a large scale showed that an elevated impact over bat populations occurs particularly when wind farms are constructed in the vicinity of maternity colonies, as well as in the immediate vicinnity of bat shelter areas. No maternity colonies were identified in the analyzed area, and monitoring results showed that solely the Babadag Forest edges constitute preferential feeding and shelter areas. The locations of the two wind farms are open areas, subjected to wind, with a reduced trophic supply compared to ecotone areas. It can therefore be concluded that the 53 wind turbines within the wind power ensemble will not generate a cumulative impact over bat populations pertaining to the species identified in the area.

In conclusion, following a detailed analysis of avifauna and chiropterofauna structure, as well as the potential impact of the Dorobantu-Topolog wind farm upon these components of biodiversity, the elaborator of the study determines that impact to be insignificant, such that Natura 2000 conservation objectives will not be affected.

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7. MEASURES OF REDUCING THE IMPACT

Throughout the project implementation period, it is advisable that beneficiary contracts a company/firm/institution specialized in the field of biodiversity, to be actively involved in the sustainable implementation of the objective proposed by the plan/project.

Measures imposed during the construction period

The location must be kept very clean at all times, in order to reduce the anthropogenic effect on the area analyzed as much as possible.

In addition, a waste management as efficient as possible must be applied, given that garbage attracts anthropophile birds. The intensification of interspecific competition in this case may lead to a decrease of resident species populations.

Banning noise levels above the limits permitted by the standing legislation. Imposing restrictions regarding working hours throughout the day or the year, so that the noise impact is as small as possible.

The formation of puddles in the area of the turbine foundations cannot be allowed, as it may cause technical malfunctions (inclination of the tower), which requires new, unforeseen interventions in the afferent areas in order to remedy the problems, which imply an additional, unmeasured impact on biodiversity. These puddles are undesired within the site, because they can attract a number of fauna species not specific to site: insects, amphibians, reptiles, respectively bird species.

Measures for protecting the species and habitats from the Northern Dobrogea Plateau SCI

How and where the waste will be stored during the construction of the objective must be taken into account, and after completion of the construction – assembly operations, the site will be freed from waste and debris, so as not to affect the quality of the fertile soil.

It is very importantly that the uncovering-recovering operations for laying out the electrical cables will be done in stages, on sections which can be completed during one workday. This way, habitat fragmentation will be avoided and the fertile soil surfaces will be immediately recovered, making the recovery period of these areas minimum.

Uncovering the layer of vegetal soil will be made by storing and protecting it, for its subsequent use, in order to prevent the development of invasive species.

The temporary storage of the turbine components and construction materials, as well as the site organization must be done as efficiently as possible, on arable lands within the wind farm, and at a distance larger as large as possible from in the forest limit (near DJ222B), in order to avoid

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the disturbance of avifauna and fauna species from Babadag Forest.

During the monitoring period, the effectiveness of the recovery process of the portions of natural vegetation affected by the uncovering-recovering up to the qualitative composition corresponding to the initial quality level must be kept in mind.

For the protection and maintenance of the initial qualitative composition of the phytocoenosis from the pasture areas included in the SCI within the site of the wind farm, we recommend that temporary storage areas for the uncovered fertile soil, which will be recovered on the afferent areas, are provided on arable land surfaces. In the same respect, as a result of soil characteristics and floristic composition found at each turbine, we recommend the separate/grouped storage of the soil uncovered from the area of the turbines, as follows:

- ME8, ME9
- LU3, LU4
- LU5, LU6, LU7, LU8
- LU9, LU10, LU11
- TO1,

and the recovering to be carried out as quickly as possible, by strictly considering the groups above.

Following the completion of the construction works and after the areas temporarily covered with excavated rock, fertile soil and construction materials deposits are cleared, it is recommended that grazing be limited in the turbine areas within the SCI North Dobrogea Plateau (see above), as well as that related infrastructure be reduced, for a period of at least 1 year (one vegetation season). This measure is taken in order to allow the return of vegetation on the surfaces initially affected by construction works, being at the same time beneficial for the local fauna.

Land Power purchased additional lands surroundings the wind farm project. These lands are currently used as agricultural lands and will be leased as agricultural lands during the wind farm operation. Land Power have to use these lands only as grazing lands in order to restore the losses habitat.

The pasture surface permanently affected by the construction of the wind farm elements is of about 3Ha. To compensate for the loss of the pasture habitat, arable land plots (Nc295, Nc345, Nc1196, Nc1275) were chosen, in the area of turbines ME-06, Me-10, ME-07 and Lu-01, with a total area of 7.5 Ha were identified in the vicinity of existing pasture areas. These plots were chosen with the purpose of creating continuity for the habitat presently used by local species, in particular as feeding habitats.

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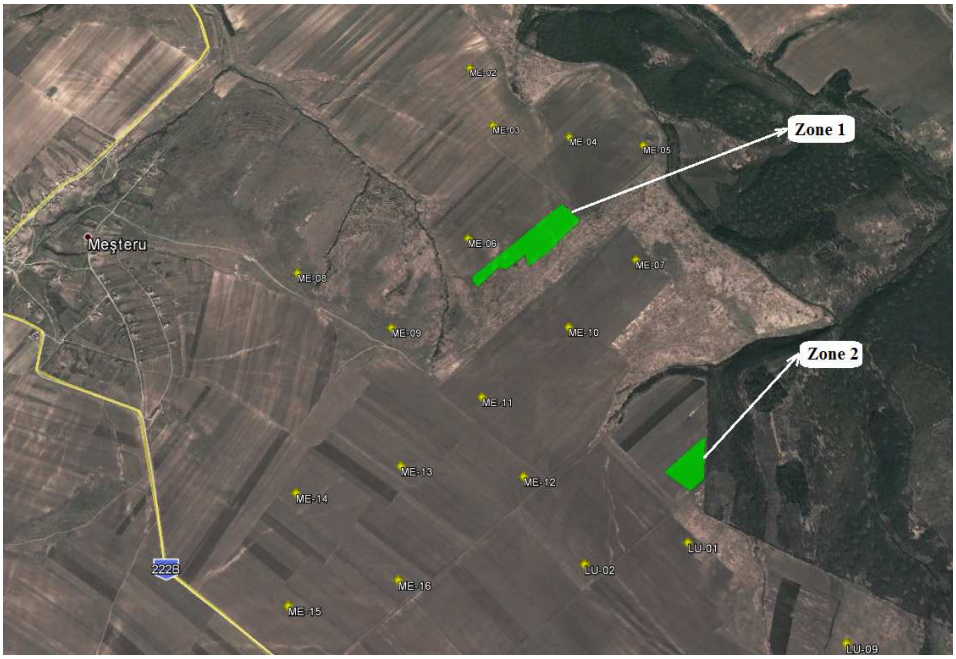

Figure 69. *Arable land proposed for conversion into pasture area*

Table 46. Geographical coordinates in the WGS 84 system

No.	*Zone 1* Geographical coordinates in the WGS 84 system	
	N	E
1	44°55'28.32	28°19'32.66
2	44°55'31.20	28°19'37.02
3	44°55'30.82	28°19'38.37
4	44°55'33.14	28°19'42.16
5	44°55'31.50	28°19'42.68
6	44°55'31.47	28°19'43.23
7	44°55'38.61	28°19'53.41
8	44°55'41.43	28°19'49.79
9	44°55'29.96	28°19'31.60
10	44°55'29.35	28°19'31.58

No.	*Zone 2* Geographical coordinates in the WGS 84 system	
	N	E
1	44°55'02.12	28°20'07.07
2	44°54'59.64	28°20'11.65
3	44°55'01.29	28°20'14.23
4	44°55'07.13	28°20'15.47

Measures provided for some areas of interest for the protection of fauna species within the site

The execution of the work for turbines ME8, ME9, ME6 is not to involve (by storing or temporary crossings) grassland surfaces other than those targeted by the plan's objectives. It is also recommended that noise is limited between March-August, the reproductive period for a number of fauna species.

We recommend that the execution of the work for turbines LU9, LU10 and LU11 is carried outside the March-August interval, the reproductive period of the species of fauna and avifauna. Banning of any type of activity at a distance from the forest line less than that formed by the three turbines is also recommended. Therefore, a protection area of a minimum of 210 m from the forest will be maintained in this area of ecological importance.

Measures that are imposed during the operating period

Measures for the protection of the avifauna species within the Babadag Forest SPA

During operation of the objectives proposed by the plan, the monitoring will be conducted over a period of 3 years, with the possibility of extension, depending on the conclusions arising from the interpretation of data from direct observations, correlated with existing bibliographic data.

If after monitoring the bird collisions with turbines of the wind farm (according to the Monitoring Plan proposed and approved by the local environmental authority), significant mortalities are recorded, which may affect the populations from the area analyzed, it is recommended that certain turbines, or even the entire wind farm is turned off over certain periods of time (eg. peak periods of migrations, or before extreme weather forecasts of storms, fog, etc.).

In the same respect, the results of the monitoring may require the purchase of automatic detection systems of bird colliding with moving elements of the wind turbines. These systems, already implemented in some EU countries, have a higher accuracy than the direct monitoring of injured or dead specimens on site for several reasons:

1) they record the collision in real-time, as well as the weather conditions and operating conditions of the turbine at that time;

2) results are not influenced by the activities of the scavenger species on site;

3) as opposed to the classical method, in which specimens which are injured, but can die outside of monitoring area, can be omitted, when applying these automated detection systems, all collisions are recorded.

The results of the monitoring may also require purchasing short-range or long-range detection systems (radar), that can intervene directly in the management of the wind farm, and can cease its activity in time, if it is found that the affected area will be crossed by flocks of birds for their migration.

The turbines should be signaled at night with flashing light, with large time intervals between two consecutive ignitions, because light will make the birds more cautious and avoid the area. These turbines are more easily recognized by migratory birds, when using alternative lighting, in detriment of using continuous light.

Increasing the visibility of the rotor blade by painting the blades in contrasting colors for at least 20% of the turbines in the wind farm. Following studies, the recommendation is to use UV coating, which can reduce the risk of collision, at least in conditions of good visibility (Drewitt, A., 2006).

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Given the risks that the design of the wind turbines may induce, creating potential resting and perching places for birds and/or bats, it must be noted that the VESTAS V 90 – 2 MW turbine type reduces these risks to the maximum, because of its structural particularities.

Given the conclusions of mathematical studies modeling the risk of collision of birds with the rotor blades (Tucker, 1996), it is shown that for turbine models with rotors, and which have a low tip speed ratio = TSR, the safety index is higher.

In the case of the Vestas V 90 turbines proposed to be emplaced, the diameter of the turbine rotor is 90 m and the TSR is 5.69, which can be considered an average value.

Regarding the number and type of turbines, the option of a large number of low power turbines was analyzed (84 turbines of 1.5 MW each) and the option of a smaller number of high power turbines (42 turbines of 3 MW each). The option with fewer turbines with an increased power was chosen, which will imply affecting a more reduced surface of land, a more limited infrastructure and a shorter construction period. Finally, the beneficiary proposed changing the 3.0 MW wind turbines with the same type of Vestas V90 wind turbines, but with lower power - 2.0 MW, so that the total installed capacity of the wind farm decreased from 48 MW to 32 MW. Basically the use of the same type of wind turbines was proposed, but of less power, respectively 2.0 MW. The only change in this case is the power of the generator located in the nacelle of the wind turbine, as the other construction features remain unchanged.

Constant monitoring of the specimens of birds and bats found injured or dead around the wind farm is required, as well as storing this information for building conclusive databases.

Bringing, feeding and housing stray dogs within the site of the wind is prohibited, as they can have a negative impact on local wildlife.

It is recommended that, following the completion of the construction works, access at the site be strictly limited to the personnel employed for the maintenance and monitoring of the wind farm, that traffic be limited and that dogs be prevented from using the wind farm site as shelter. These measures are designed to limit antrophic impact on the wind farm site, such that fauna initially dislocated from the construction sites can return to use affected habitat areas.

The monitoring over a well established period ensures the constancy of the observation and data collection at optimum times provides data regarding the capturing of key periods for the ecology of the species (breeding, migration), their relationship with different types of habitats, etc., also providing the opportunity of quick and effective interventions, if unanticipated effects are observed.

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Further measures for the protection of Chiroptera species, including from the North Dobrogea Plateau SCI

Regarding the Chiroptera fauna in general, all studies consulted agree in concluding that there are, still, measures of reducing the impact that the wind turbines can produce on it.

These measures are:

During the construction period (EUROBAT 3)

- Respecting a minimum distance of 200 m from forested areas.
- The construction activities should be scheduled throughout the day, as well as throughout the year, when bats are not active. Planning should be conducted for each species in correlation with the park's location and yearly weather conditions/forecasts.
- The construction work is to be carried out in time intervals which allow the reduction of the noise, vibration, lighting and other disturbance on bats.
- It is recommended that construction works executed less than 200 m away from the forest cease during nighttime, especially works on the access roads which make use of a large number of heavy equipment and projectors which might attract insects.
- During both the construction and the operation phases, it is forbidden to utilize barbed wire for fencing the construction site or collector / converter substations, or for any other purpose. This measure is important also for reducing impact on the local avifauna.

During the operating period

- Depending on the location and the impact level, particular attention must be paid to planning the operating conditions of the park, so that there is the possibility of introducing restrictions regarding the operation of the wind farm during peak bat activity, such as during the autumn migration.
- Given that bat mortality is generally recorded during nights when the wind velocity is low, as they are active in search of food, it is recommended that the turbines start operating at medium to high wind intensities. In this case, recent studies in the U.S. and Canada recorded a decrease in bats mortality of over 93%.
- Reducing the negative effects produced by turbine lighting (light attracts insects which, in turn, attract bats), nighttime lighting for the turbines using projectors or powerful lights with continuous lighting which can attract insects in large numbers, which in turn may cause some bat species to fly into the turbine blade action radius.

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8. MONITORING THE IMPACTS

Both during the construction and operating period of the objective, it is recommended that the activities are assisted (in all phases they imply) by specialists in the field of biodiversity and environmental protection, in order to comply with measures for reducing the impact. Complying with the measures is a result of implementing a judicious management of the construction work, and of a well-established relationship between the constructor and the beneficiary, in terms of environmental protection responsibilities during the project implementation.

The Monitoring Program during construction involves a complex monitoring, which follows the evolution of the biodiversity in the studied area in correlation with the construction activities carried out. The monitoring program followed EBRD requirements and performance criteria for Biodiversity Conservation and Sustainable Management of Living Natural Resources (PR6).

The monitoring at this stage of project implementation involves:

- making field observations focused on the main objectives of biodiversity monitoring;
- taking photographs on site, following the various execution stages of the building/assembly work;
- data analysis and interpretation;
- recommending additional measures for diminishing the impact (if applicable)
- conducting monitoring reports regarding the effects of the construction work on biodiversity.

Monitoring the spontaneous flora and habitats will be carried out depending on:

- The qualitative and quantitative evolution of the flora within the studied perimeter – in this case, we will proceed to monitoring the number of species and individuals (or the surface occupied by a population), and the limiting factors discovered will be specified (where it was the case) and remedial measures will also be stated;
- The evolution of the vegetation in the area - the discovered limiting factors will be specified and the necessary measures will be drawn to remedy the situation;
- The evolution of the species, associations and habitats within the studied perimeter – the discovered limiting factors will be specified and the necessary measures will be drawn to remedy the situation.

The number and distribution of the sampling plots, transects and data collection schedule will be established after the first six months of monitoring. Also, if during field data collection, a significant damage to biodiversity is found, the examiner specialist will conduct a report which

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will include: description of the situation of the species or habitat in question, the cause which led to its degradation and the measures imposed to be taken immediately.

Table 47. The main parameters followed in the habitat monitoring

Biocenoses structure	Biocenoses functions	Effect/impact/other causes
vegetation type	the seasonal dynamics of the vegetation type	- affecting habitats of Community interest - fragmentation of habitats existing on site - storage of topsoil on agricultural terrains, in areas with a steppe vegetation - agricultural practices - storage of waste etc. - natural causes (eg. climate change)
qualitative and quantitative characteristics	changes in the specific composition and dynamics of the populations	- uncovering portions of topsoil along with the herbaceous layer - agricultural practices etc.. - the introduction of invasive/allochthonous species - storage of waste etc. - natural causes (eg. climate change) - affecting other land surfaces than those stipulated in the project - affecting other areas of land than those stipulated in the project
species of conservation interest	Phenology	- disturbance represented by the movement of vehicles, - agricultural practices etc.. - storage of waste etc. - the introduction of invasive/allochthonous species - any outside storage areas other than those designed for this purpose. - natural causes (eg. climate change, pressure from competing species, herbivores, etc.). - affecting other areas of land than those stipulated in the project

The fauna monitoring program has to be conducted so that it can reveal data regarding all categories of animals that could be present within the site, namely: invertebrates, amphibians, reptiles, nesting birds or summer guests, sedentary birds, guests during the winter and migrating birds (passing through), which could migrate over the site, chiropters, mammals (other than chiropters).

Table 48. The periods over which the fauna monitoring will be conducted

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Invertebrates												
Amphibians												
Reptiles												
Nesting birds												

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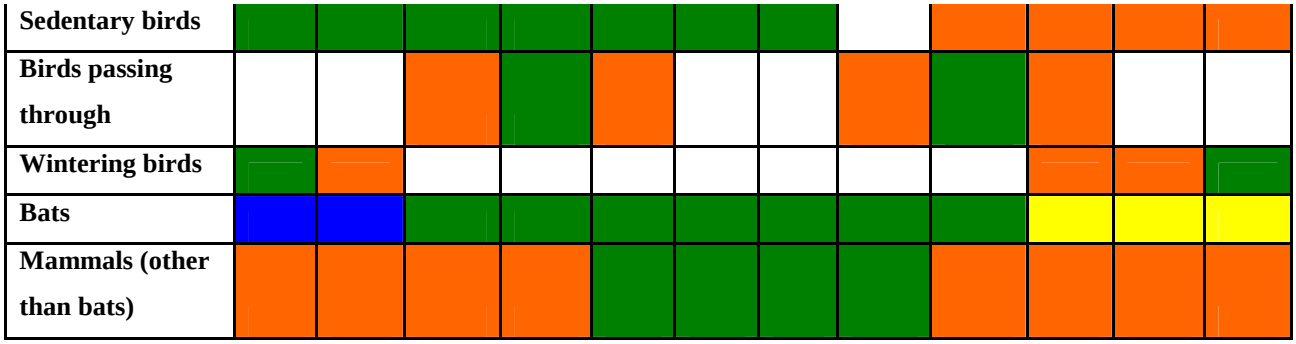

For the bird species, although certain favorable periods for the evaluation of each category are known (nesting, passing through, sedentary), no strict dates for collecting information should be established, due to the fact that climate changes or other external factors may influence the dynamics of the birds, and these strict dates may negatively influence the quality of the data obtained. In this respect, it is recommended that within each monitoring stage, a sufficient number of days for collecting data is established, to include all stages of a stage, as follows:

1. nesting birds: both the hatching period and the growing of the chickens.
2. birds passing through (migratory): for each migration period (in spring or autumn), to include the beginning, the peak and the end of the migration period.
3. birds that are winter guests: a period to include the arrival of the birds in the wintering sites, the dynamics from the wintering sites and their departure towards their nesting locations
4. sedentary birds: they will be monitored during the on site visits for the nesting and wintering birds.

The effects on the bird populations within the site will also be observed in comparison with data regarding the presence/absence of species representatives observed by the evaluator, and presented in Environmental Studies and Monitoring Reports from the pre-building stage.

The Fauna Monitoring Plan will include more specific features depending on the taxonomic group, as highlighted in the table below, and each objective set is measurable by using specific indicators.

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Table 49. Fauna monitoring plan

Taxonomic group	**Objectives**	**Indicators**
Invertebrates	Monitoring the populations of invertebrates present within the site	1. Identification of all invertebrate species 2. Emphasizing a possible impact of the activities carried out during the construction work
Amphibians	Monitoring the populations of invertebrates present within the site	1. Identification of all amphibian species; 2. Emphasizing a possible impact of the activities carried out during the construction work
Reptiles	Monitoring the populations of amphibians present within the site; Minimizing the impact during the construction of the wind turbines, by having biodiversity specialist assisting the construction work.	1. Identification of all reptile species; 2. Emphasizing a possible impact of the activities carried out during the construction work; 3. Relocating the reptile specimens from the work areas
Nesting birds	Continuing the monitoring of the nesting bird distribution within the site; Monitoring the ethology of nesting bird species within the site during the construction of the turbines Planning the construction stages of the wind farm, so that they do not interfere with the actual nesting period of these species.	1. Filling in the current data with the data obtained from the monitoring program; 2. Emphasizing bird behavior from the periods analyzed in comparison with their initial behavior; 3. Respecting the recommended periods.
Birds passing by	Monitoring the migration dynamics within the perimeter of the wind farm, as well as in the adjacent areas; Monitoring the behavior of the bird species passing through during the construction of the wind turbines.	1. Filling in the current data with the data obtained from the monitoring program. 2. Emphasizing bird behavior from the periods analyzed in comparison with their initial behavior (before the project was implemented).
Birds which are winter guests	Monitoring the seasonal displacement of the winter guests bird populations from the wintering sector	1. Filling in the current data with the data obtained from the monitoring program. 2. Emphasizing a possible

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		impact of the activities carried out during the construction work
Mammals (other than bats)	Monitoring the resident mammal species, as well as those which can cross the site; Monitoring the dynamics of the mammal species within the site.	1. Filling in the current data with the data obtained from the monitoring program; 2. Emphasizing a possible impact of the activities carried out during the construction work
Chiroptera	Monitoring the dynamics of the Chiroptera species within the site.	1. Filling in the current data with the data obtained from the monitoring program 2. Emphasizing a possible impact of the activities carried out during the construction work

Monitoring program during operation

During the operation of the objective, the monitoring will be conducted over a period of a minimum of 3 years.

Monitoring of spontaneous flora and habitats will be conducted in order to identify existing species of flora on site, as well as to observe the stages of vegetation recovery from the affected areas after the construction works of the objective is carried out.

The phytocenologic approach which involves, in addition to the floristic inventory, conducting phytocenological surveys, has a major relevance in the study of an area's vegetation, for being able to characterize associations and existing habitats, and correlate the data obtained by using this method with that obtained in the preliminary stages of monitoring.

When monitoring wildlife, observations should be made regarding the main groups of invertebrates and vertebrates, with emphasis on the species of conservative interest, following the same monitoring protocols as those listed in the previous chapter, regarding the monitoring during construction work.

After each on site visit, monitoring sheets will be drawn up, which will the basis of data centralizing - essential for the statistical analysis of the data obtained.

Apart from monitoring activities mentioned during the construction period, any cases of deaths or injuries of bird or bat species will be monitored. Since bodies of bats hit can be thrown further by the taller turbines, the research will be conducted within a radius equal to the total height of the turbine – 150 m.

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Given the collision risk of bats with operating wind turbines (especially those from the vicinity of Babadag Forest), a particular attention will be given to monitoring them, as in the case of the avifauna and bird migration.

Therefore, the site will be analyzed during the maximum activity periods of bats:

1. Coming out of hibernation (April-May);
2. Feeding activity (June-July)
3. Autumn migration (August-October).

In case of violent weather events such as storms, fog, heavy rain or snow storms, the location of the sub-wind farms will be visited immediately (after the weather conditions improve), for an on site analysis of the effects of wind turbines on birds in poor visibility conditions. The areas around wind turbines will be particularly analyzed.

During the migration periods, the relationship between weather conditions and the behavior of birds towards the presence and operation of the wind farm will be taken into account, namely: number of species, number of specimens of the same species, flight direction and distance from turbine, flying height in comparison with the range of action of the wind turbine blades.

During the breeding period of birds, the species that nest within the site and in the vicinity will be monitored, as well as the effects of the operation of the wind farm on them.

Each day of onsite avifauna observations must be materialized by filling an observation sheet.

- The monitoring sheet will be filled with observations regarding: weather conditions, physical parameters of the biotope, flight height at which the birds were observed against the wind turbines, the time at which avifauna specimens were observed, as it can provide data regarding the vulnerability periods of birds in different times of day (morning, evening), GPS coordinates of the location (if dead specimens are identified).
- Furthermore, if dead specimens are observed, their condition will be written down:

  - Intact (which is not in an advanced stage of decomposition, which has not been bitten by other animals)

  - Rest of the carcass or feathers (due to the fact that it served as food for other animals)
- If birds passing through are noticed, details will be written down regarding the flock shape, direction and flight height, the period and place of rest.
- If nests are identified within the monitored area, the number of eggs/specimens/gender will be written down, as well as the GPS coordinates;

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Table 50. Monitoring team

Name	Qualifications and competencies	Responsibilities during monitoring
Jianu Loreley	Biologist M.Sc., PhD. student, specialist in biodiversity conservation, botanist	Monitoring coordinator; inventory of flora species; analysis and interpretation of data; conducting monitoring reports;
Cugut Artur	Ecologist, habitat specialist, phytocenologist	Analysis of the structure of phytocoenoses, identifying habitats; entomofauna monitoring; conducting monitoring reports.
Iordache Daniela	Biologist, M.Sc. vascular plants specialist	Inventory of flora species; drawing monitoring sheets.
Tudor Marian	Biologist PhD., specialist in biodiversity conservation, herpetology expert, member of SOR (Romanian Ornithological Society)	Fauna monitoring; assessing the impact on the fauna; statistical analysis and data interpretation.
Skolka Marius	Biologist PhD., specialist in biodiversity conservation, entomology expert	Entomofauna monitoring; analysis and interpretation of data
Buhaciuc Elena	Biologist PhD. student, specialist in biodiversity conservation, member of SOR (Romanian Ornithological Society)	Fauna monitoring; asessing the impact on the fauna
Anca Dragu	Biologist, C.S. in the framework of the Institute of Speleology "Emil Racovita",Bucharest	Bats sounds analysis; inventory of bats species; interpretation of data
Muntean Alina	Ecologist, M.Sc. specialist in biodiversity conservation	Ornithofauna inventory; database management.
Pahon – Anca Mariana	Biologist, environmental evaluator	Developing measures of reducing the impact, assessing the compliance with environmental requirements.
Vasile Daniela	Ecologist PhD. student., pollution specialist	Anthropogenic impact assessment; identification of any environmental pollution issues.

We mention that, only as a result of direct observations during the construction and operation of the objective, definite conclusions can be drawn regarding the effects of the wind farm on biodiversity (including side effects).

Moreover, we consider that monitoring both phases of the objective (construction and operation) by specialists in the field of biodiversity will lead to the reduction or elimination of any unforeseen side effects, by taking practical measures, adjusted to the practical situations on site.

Throughout the duration of the monitoring, the team members will use suitable protective equipment, adapted to weather conditions and specific to the type of activity.

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QUALIFICATIONS OF COLLABORATORS INVOLVED IN MONITORING PROCESS

Name	Qualifications and competences	Responsibilities during monitoring
Marian Tudor	Doctor in Biology, Specialist in biodiversity conservation (master in biodiversity conservation domain), Herpetologist Expert, SOR member (member of Romanian Ornithological Society), SRH member (member of Romanian Herpetology Society). Competence in ornithology.	Inventory of herpetofauna. Avifauna Inventory (inventory of birds species). Inventory of chiropters-fauna (bats). Statistic Analysis and interpretation of data. Assessing the impact on fauna.
Marius Skolka	Doctor in Biology, University Professor, Specialist in biodiversity conservation. Expert in entomology. Member of Romanian Lepidoptera Society,. Participant as project leader to over 30 programs and grants that focused biodiversity inventory at national and border level.	Deep management and analysis of data resulted from monitoring activities. Planning and organizing monitoring activities. Overall monitoring of entomofauna (with reference to the trophic resources of avifauna) chiropters-fauna (bats) monitoring. Nocturnal avifauna monitoring. Assessing the impact on fauna.
Loreley Jianu	M.Sc. Biologist, PhD student on plant biology Specialized in environmental integrated management. Specialist in biodiversity conservation. Member of Romanian Ecological Society (SRE). Member of Romanian Society for Cell Biology (SRBC).	Monitoring activity coordinator. Inventory of flora species. Data analysis and interpretation. Observations on the relation species – habitat in the studied area. Conducting monitoring reports.
Elena Buhaciuc	M.Sc. Biologist. PhD student in biology. Specialist in biodiversity conservation. SOR member (member of Romanian Ornithological Society). Competence in ornithology.	Inventory of avifauna (birds) and chiropters-fauna (bats). Identification and observation of avifauna during the last years from the emplacements where were realized and approved wind park projects. Inventory of herpetofauna. Primary management of inventory data. Assessing the impact on fauna.

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Daniela Vasile	M.Sc. Ecologist. PhD. Student in biology. Pollution Specialist. Master in environmental impacts management.	Primary management of inventory data. Management of information regarding environmental impacts. Anthropogenic impact assessment. Identification of environmental pollution issues.
Artur Cugut	Licensed in Ecology.	Conducting monitoring reports Avifauna (birds) and chiropters-fauna (bats) observations. Primary analysis of data from monitoring. Identifying and observing avifauna during the last 2 years on emplacements where were realized and approved wind park projects. Analysis of phytocecoenosis structure and habitatas identification.
Daniela Iordache	M.Sc. Biologist. Participant to birds monitoring projects for SOR (Romanian Ornithological Society). Specialist in biodiversity conservation. Competence in ornithology.	Avifauna inventory. Primary analysis of data from monitoring activities. Identification and observation of avifauna during last 3 years on emplacements where were realized and approved wind park projects. Inventory of flora species.
Mariana-Anca Pahon	M. Sc in Integrated Environmental Management. Licensed in Biology. Certified Environmental Evaluator. Biology teacher.	Analysis and interpretation of data, Management of data resulted from monitoring. Developing measures of reducing the impact. Assessing the compliance with environmental requirements.
Alina Muntean	M Sc. in Integrated Environmental Management. Licensed in Biology. Competence in ornithology.	Identification and observation of avifauna during last 2 years on emplacements where were realized and approved wind park projects. Avifauna observations. Data base management. Primary analysis of data resulting from monitoring.
Anca Dragu	Biologist, Researcher at the Institute of Speleology "Emil Racovita" Bucharest	Identification of chiroptera species after the analysis of sonograms and spectrograms; management of inventory data

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