ANEMOS EVROU M.I.K.E.

SPECIAL ECOLOGICAL ASSESSMENT STUDY

CATEGORY A1 of Annex X of the Decision YPEN/DIPA/17185/1069

(Government Gazette 841B΄/24-2-2022)

FOR THE 130.2 MW wind farm PROJECT AT "AETOKORFI" SITE OF THE MUNICIPAL UNIT OF TRIGONO OF THE MUNICIPALITY OF ORESTIADA, REG. AUTH. OF EVROS

STUDY:

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I. INTRODUCTION – LEGISLATIVE FRAMEWORK

The present Special Ecological Assessment (SEA) study is prepared in the context of the Environmental Licensing of the **130.2 MW Wind Farm project** of **"ANEMOS EVROU M.I.K.E. "** in the location **"AETOKORFI"** , in the Municipality of Orestiada, in the Reg. Auth. of Evros.

This SEA study is prepared in accordance with the requirements set for category A1 projects by article 10 of Law 4014/2011 (A' 209) regarding the " *Environmental licensing procedure for projects and activities in areas that have joined the Natura 2000 network* ". The locations of the W/T of the Wind Farm under consideration are located outside the boundaries of the SPA area of the Natura 2000 network named "Parapotamio Dasos Voreiou Evrou kai Arda" (GR 1110008), as the closest distance of the W/T from the boundary of the area is 39.17 m . The connection of Wind Farm to the electricity network is proposed to be made with the existing substation of Orestiada with the construction of an exclusive underground line.

The proposed 33kV medium voltage underground line of the interconnection will have a total length of approximately 36.24 km and will be constructed along the existing roads.

Alternatively, the connection to the network could be:

- in a new 33/150kV Voltage Raising Substation in the route zone of the transmission line KYT NEAS SANTAS – S/SO ORESTIADAS with underground cable to a medium voltage substation, with a total length of approximately 35.63 km, along the existing roads.

This SEA study is prepared in accordance with the specifications set by MD 170225/2014 (Government Gazette 135/B') " *Specification of the contents of environmental licensing files for projects and activities of Category A'" of the decision of the Minister of Environment, Energy and Climate Change with 1958/2012 (B' 21) as applicable, in accordance with article 11 of Law 4014/2011 (A' 209), as well as any other relevant details* .

In summary, the Legal Framework that governs the preparation of this study includes the following legislative provisions:

- JMD 33318/3028 (Government Gazette 1289/B'/28.12.1998). "Definition of measures and procedures for the conservation of natural habitats (habitats) as well as wild fauna and flora", which incorporated into National Law Council Directive 92/43/EEC of 21 May 1992 on "the conservation of natural of habitats (Habitat Directive)".
- JMD No. E.P. 14849/853/E.103 (Official Gazette 645/B'/11.4.2008). "Amendment of joint ministerial decisions No. 33318/3028/1998 (B' 1289) and joint ministerial decisions No. 29459/1510/2005 (B' 992), in compliance with the provisions of Council Directive 2006/105

of 20 November 2006 of the European Union", regarding the classification system of Annex I on "Types of Natural Habitats whose conservation requires the designation of territories as Special Protection Areas

- JMD 37338/1807/E.103 (Government Gazette 1495/B΄/2010). "Definition of measures and procedures for the conservation of wild birds and their habitats, in compliance with Directive 79/409/EEC "On the conservation of wild birds", of the European Council of April 2, 1979 , as codified by the directive 2009/147/EC'.
- E.P. 8353/276/E.103 (Official Gazette 415/B΄/2012). "Amendment and completion of no. 37338/1807/2010 JMD in compliance with the provisions of the first paragraph of article 4 of Directive 79/409/EEC "On the conservation of wild birds" of the European Council of April 2, 1979 , as codified by the 2009 directive /147/EC".
- Law 3937 (Official Gazette 60/A'/31.3.2011). "Conservation of Biodiversity and Other Provisions".
- Law 4011 (Official Gazette 209/A'/21-9-2011). "Environmental licensing of projects and activities, regulation of arbitrary structures in connection with the creation of an environmental balance and other provisions of the competence of the Ministry of Environment."
- E.P. 14849/853/E.103 (Official Gazette 645/B'/11-4-2008). "Amendment of joint ministerial decisions No. 33318/3028/1998 (B΄1289) and joint ministerial decisions No. 29459/1510/2005 (B΄992), in compliance with the provisions of Council Directive 2006/105 of 20 November 2006 of the European Union"
- MINENV/DUP/68605/1092 (Government Gazette 248/A'/25-10-2018). "Approval of the Revision of the Regional Spatial Framework of the Region of Eastern Macedonia and Thrace and its Environmental Approval."
- "DIRECTIVE 2009/147/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 November 2009 on the conservation of wild birds"
- "COUNCIL DECISION 2006/871/EC of 18 July 2005 on the conservation of migratory waterbirds of Africa and Europe"

II. GOAL AND OBJECT OF THE STUDY

The purpose of the preparation of this Special Ecological Assessment is the analysis of the environment, the description, assessment and evaluation of possible significant impacts that the construction of the "Aetokorfi" Wind Farm project may cause to the structure and ecological functions of the project research area, in order to draw conclusions as to whether the integrity and conservation objectives of the Natura 2000 network areas adjacent to the project in question are affected.

Specifically, the subject of the SEA study concerns:

- Inventory and detailed description of the protected object located in Natura 2000 sites and include habitat types and species of flora, fauna and avifauna, based on available official and published data and the results of fieldwork in the project research area.
- Natura 2000 sites in terms of their conservation status as well as the structure and ecological functions in Natura 2000 sites.
- Evaluation of the existing and proposed environmental protection measures with regard to the effectiveness of protecting the integrity and conservation objectives of the concerned Natura 2000 areas and possible proposal of additional measures to protect the ecological function of the Natura 2000 areas.

STUDY AREA – FIELD RESEARCH

A. STUDY AREA

All of the projects are located on the Greek-Bulgarian border, with the locations of the WT and accompanying projects located within the administrative boundaries of the Municipality of Orestiada, Reg. Auth. of Evros. The place Aetokorfi is located in the M.U. of Trigono, which belongs to the Municipality of Orestiada, of the Evros Regional Unit located in the Region of Eastern Macedonia - Thrace, according to the administrative division of Greece as formed by the "Kallikratis" program. The capital of the municipality is Orestiada and it belongs to the geographical district of Thrace. The Settlements of M.U. of Trigono near which the project under study is planned is, from South to North, that of Therapeio, Komara, Pentalofos and Petrota.

The Study Area (SA) in the case of the project under study includes the entire area of the areas of the Natura 2000 network within which parts of the Field Research Areas are located, i.e. the area of the following Special Protection Zones for avifauna (SPA) :

- **Riparian Forest of North Evros and Ardas GR1110008**
- **Yazovir Ivaylovgrad BG0002106**

The Natura 2000 network is the ecological network for the conservation of wild animal and plant species and natural habitats of Community importance within the European Union. It consists of sites (areas) classified under the Birds Directive (Directive 2009/147/EC), which was first issued in 1979 (79/409/EEC) and the Habitats Directive (Directive 92/43 /EEC), which was issued in 1992. The following image shows the Study Area and adjacent areas. The map below shows the spatial relationship of the project under study and the proposed interconnection, with the Natura 2000 network and the Wildlife Refuges in the Municipalities of Orestiada and Didymoteicho, R.Auth. of Evros, but also of the Municipality of Kardzhali , Bulgaria.

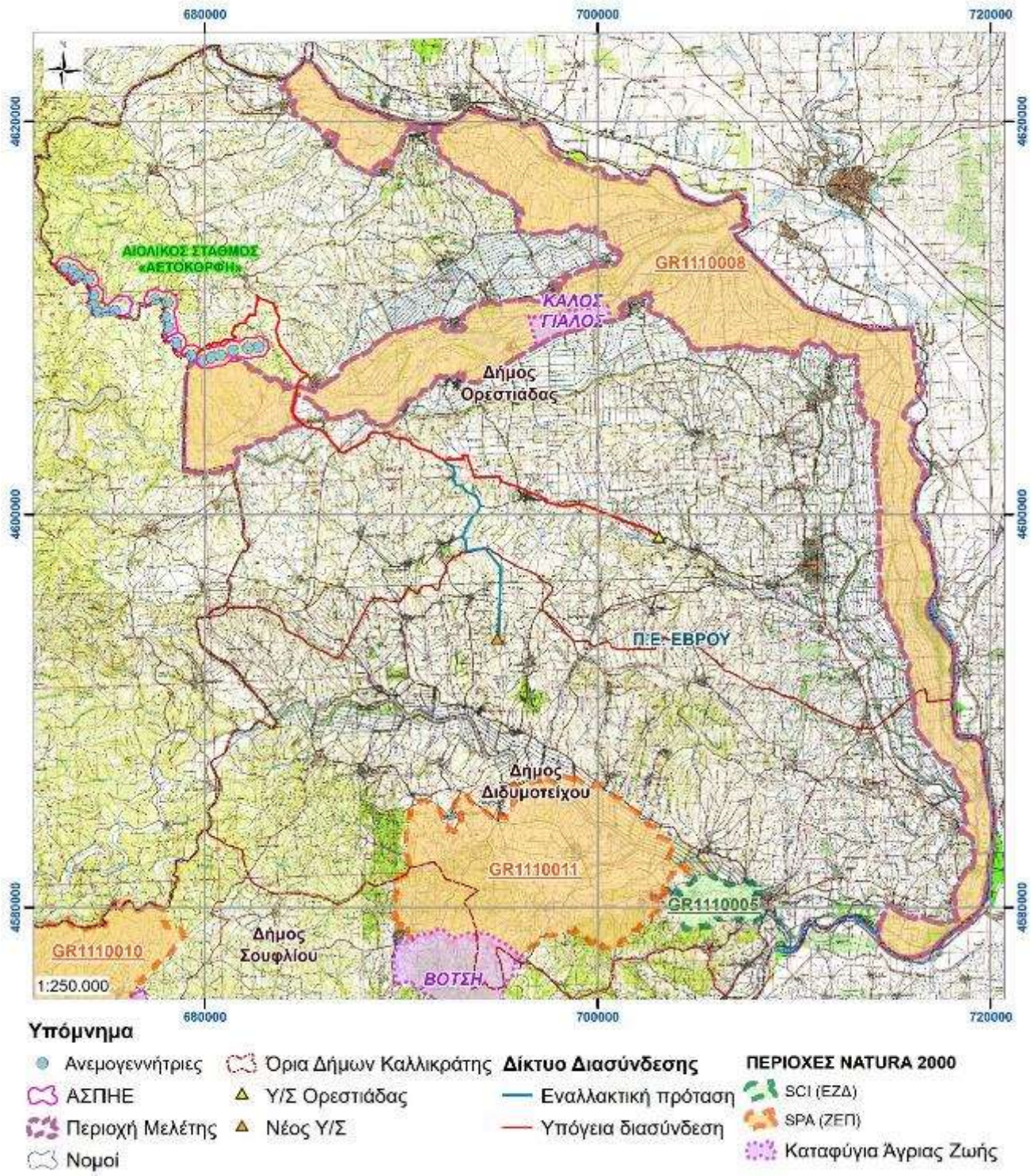

Figure 1-1 : Study Area of the NATURA 2000 Network, SPA GR1110008 - " Riparian Forest of Northern Evros and Arda" and Wildlife Refuges, in relation to Wind Farm polygons

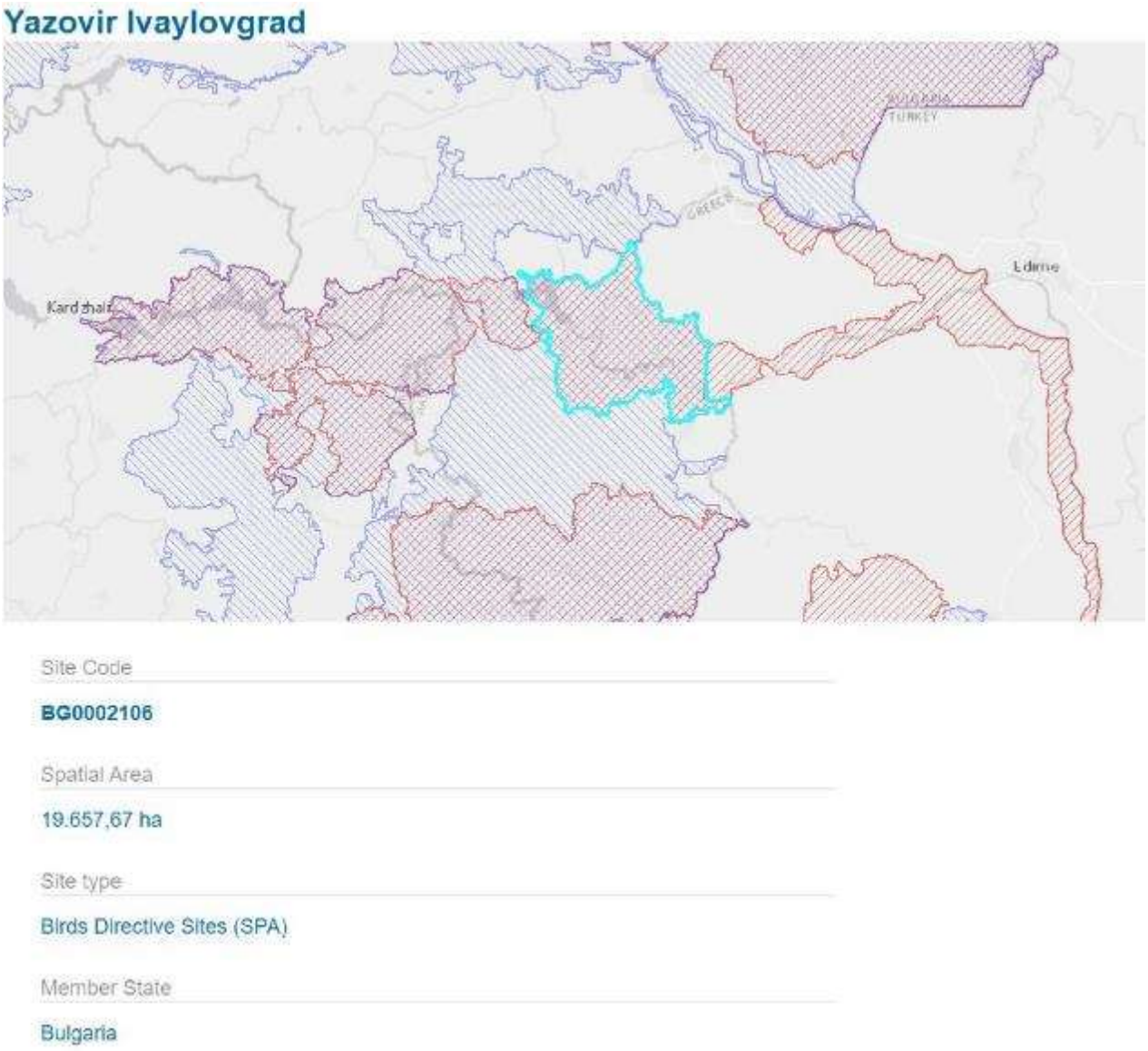

Figure 1-2: Study Area of the NATURA 2000 Network, SPA BG 0002106 - " Yazovir Ivaylovgrad" (source: *Natura 2000 Network Viewer* , retrieved 11/22/2022)

B. FIELD RESEARCH AREA

According to the applicable specifications for the preparation of SEA studies, the Field Research Area (FRA) in which the field work is carried out to record the types of habitats and species of flora, fauna and birdlife in the relevant Natura areas, is defined for area and point projects of subcategory A1 as the zone on either side at a distance of **1000 m** from the boundaries of the occupation zone of the project polygons.

Based on the above, the FRA of the "Aetokorfi" Wind Farm under study is illustrated in figure 1-3.

The FRA under study, which concerns the wind turbines of Wind Farm, occupies an area of 28,377,977.91 m^2 or 2,837.80 ha . The FRA under study, which concerns the interconnection of the park with the SS of Orestiada, occupies an area of 62,735,335.89 m^2 or 6,273.53 ha . The FRA of the alternative connection of the Wind Farm with the New Substation occupies an area of 20,989,465.85 m^2 or 2098.95 ha . In total, the FRAs cover an area of 112,102,779.66 m^2 or 11,210.28 ha .

Surface area of 6,233,487.14 m^2 or 623.49 ha with a percentage of 5.56% of the total FRA, is located within the SPA area with code GR1110008 "Parapotamio Forest of Northern Evros and Arda". Surface area of 7,980,657.07 m^2 or 798.07 ha with a percentage of 7.12% of the total FRA, is located within the borders of Bulgaria and within the SPA area with code BG0002106 "Yazovir Ivaylovgrad". Due to the proximity to the SPA areas and the importance of the areas for aquatic and predatory bird species, the entire area is considered to be within the NATURA 2000 areas .

Based on the above, the FRA of the WTs and the FRA of the cable of the "Aetokorfi" Wind Farm under study is illustrated in figure 1-3.

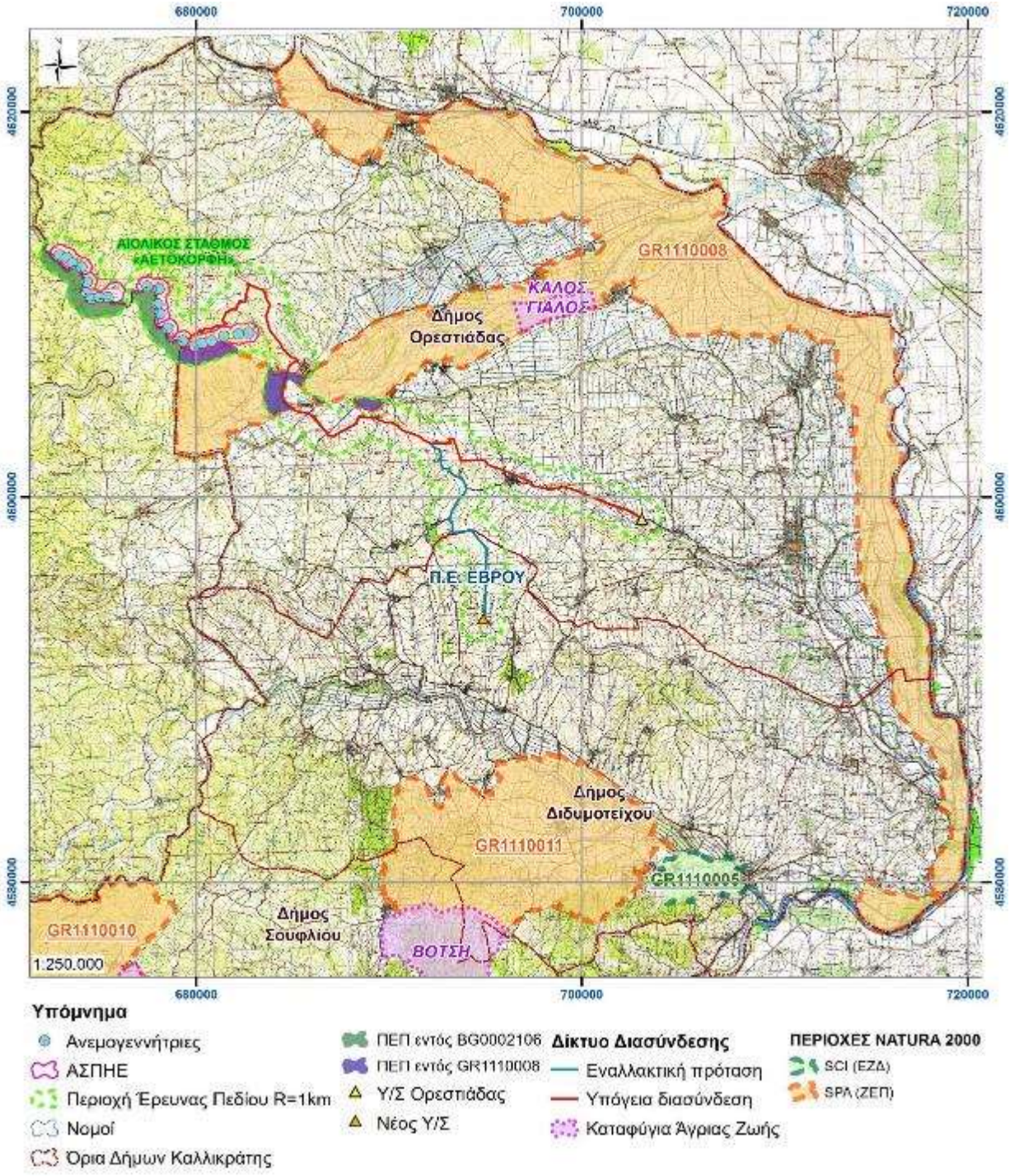

Figure 1-3. Field Research Area (FRA) of the Wind Farm under study in relation to the neighboring Protected Areas (NATURA 2000) and Wildlife Refuges

1. EXISTING STATE OF THE PHYSICAL ENVIRONMENT

I. INPUT & DATA SOURCES

According to the current specifications for the preparation of EIA studies, the description of the existing state of the environment concerns:

- The Study Area (SA), which in the case of the project under study includes all the areas of the Natura 2000 network within which the project is located, i.e. the area of the following Special Protection Zones for avifauna (SPA) :

- Riparian Forest of Northern Evros and Ardas (GR1110008)
- Yazovir Ivaylovgrad (BG0002106)

- The Field Research Area (FRA), which in this case and for its area projects includes a zone of width / radius of **1000 m** around the wind turbines of the Wind Farm under study, as point objects and a zone of width of 1000m on either side of the interconnection network axis and the alternative interconnection network.

The main subject of the description of the current state of the natural environment within the Study and Research Areas is:

- Registration of types of habitats of Annex I of JMD E.P.14849/853/E103/4.4.2008 and flora species of Annex II of JMD E.P.14849/853/E103/4.4.2008 (for SPA GR 1110008 and SPA BG0002106).
- Registration of species of fauna of Appendix II of the JMD E.P.14849/853/E103/4.4.2008 (for the SPA GR 1110008 and SPA BG0002106).
- Registration of avian species of Appendix I of JMD E.P.37338/1807/E103 (for SPA GR 1110008 and SPA BG0002106).
- Recording of characteristic types of habitats of Annex I and/or the species of Annex II of Directive 92/43/EEC (for the SPA GR 1110008 and the SPA BG0002106) and/or the avian species of Annex I of the Directive 2009/147/EC and the migratory ones.

Also, the above list includes all other important species of flora, fauna and birdlife present in the areas of the Natura 2000 network that are not included in the relevant Annexes of Directives 92/43/EEC and 2009/147/EC, but are important for conservation and site management.

1.1. RECORDING AND ANALYSIS OF THE ELEMENTS OF THE NATURAL ENVIRONMENT

1.1.1. Study Area (SA) - Riparian Forest of Northern Evros and Ardas (GR 1110008)

The wind farm under study at the location "Aetokorfi", is located in its entirety outside the boundaries of the **SPA area** with code **GR1110008** and title **Riparian Forest of Northern Evros and Ardas** . Short section of the described main and alternative grid connection passes through the SPA area, in place of an existing bridge and not in a section covered by vegetation. Polygon E of the Wind Farm under study and four of the total 21 W/Ts (WT15, WT16, WT17, WT18), is located on the borders (in close proximity) with the **SPA area** with code **GR1110008**, near the border with Bulgaria.

The priority bird species of Directive 2009/147/EU, which have been recorded in the area, were classified based on specific criteria. These criteria concern: a) Species of which Greece hosts a large percentage of the world's population and the actions implemented in the country will affect the conservation status of a significant part of their population globally (>80%). b) Species for which the planning and implementation of an Action Plan for recovery is required, as defined by the methodology developed by BirdLife International for the EU.

The criterion of conservation status from the Greek Red Book and from the IUCN assessment is added to the ranking of priority flora and fauna species.

In the area SPA GR1110008 (Riparian Forest of Northern Evros and Arda), species of priority and protection are the cinderella (*Lanius minor*), the Lagona. (*Phalacrocorax pygmeus*), the Balkan Woodpecker (*Dendrocopus syriacus*) and the Night Crow (*Nycticorax nycticorax*).

The characteristics of the area SPA GR1110008 (Riparian Forest of Northern Evros and Arda) according to the Natura 2000 data sheets are as follows:

Geographical position : X = 26.391546 , Y = 41.627484

Area: 25,161.96 ha

Maximum altitude : 332m

Minimum altitude : 0m

Administrative affiliation : Municipality of Orestiada

The riparian forest of northern Evros and Ardas occupies the northern part of the river Evros and the Adras tributary. In the area, in addition to crops, there are wetland forests with *Platanus*

orientalis , *Salix* sp . and *Populus* sp .. The forest lies in a mosaic of fields, scrubland, reedbed reservoirs, small wetlands and arable land. A large part of the area is a military zone.

Land use is traditional and non-intensive. The percentages vary as follows: agricultural uses (86%), livestock (10%), forestry (2%), urban / industrial / transport (2%)

The area is important for breeding and wintering raptors and other endemic forest species. The riparian forest of northern Evros and Ardas hosts a significant number of forest flora and is an important site for fertilization, migration and wintering of waterfowl, raptors and sparrows.

Location: Located north and east in Reg.U. of Evros and extends along the bed and riparian forest of the Evros which falls on the Greek border, but also along the bed and riparian forest of the part of the river Ardas that falls on the Greek border. The Ardas river enters the Greek border near the village of Milea and after a distance of 49.00 km it flows into the Evros river, at the Greek-Turkish border. In a direction from north to south, the Study Area extends in a zone, from the peri-urban area of Pentalofos settlement to the peri-urban area of Spileo settlement. The project under study falls under the municipality of Orestiada and the Study Area falls under the municipality of Orestiada.

Habitats: Man-made landscapes (70.17%: Arable land, Forest plantations), Forests and woodlands (0.83%: Broad-leaved forests, Mixed forests, Native coniferous forests), Grasslands (Natural grasslands, Non-arable land 12.71 %), Shrublands (0.88%: Hardwood shrubs, garrigue and maquis), Wetlands (13.99%: Rivers and streams, Riparian vegetation, Beaches, Dunes). Residential and Industrial areas, in SA, occupy a percentage area of 1.42%.

Below in table and image form are the percentages of SA's general land uses as collected from Corine 's 2018 Land Use map data.

Table 1.1 Land uses according to the data of the CORINE Land Use Map 2018

CODE / LAND USE	AREA (ha)	PERCENTAGE %
112: Discontinuous urban fabric	93 , 44	0.37%
121: Industrial or commercial units	24 , 3 6	0.096%
211: Non-irrigated arable land	2 . 417 .60	9.608%
212: Permanently irrigated land	13 . 006 , 25	52.967%
213: Paddy fields	1 , 30	0.005%
222: Fruit trees and berry plantations	77 , 22	0.306%
231: Meadows	235 , 0 8	0.934%
242: Complex cultivation patterns	3 . 035 , 8 9	13.342%
243: Land occupied mainly by agriculture, with significant areas of natural vegetation	1 . 581 , 67	3.562%
311: Broadleaf Forests	186 , 13	0.739%
312: Coniferous Forests	22 , 92	0.091%
321: Natural meadows	781 , 20	3.104%
323: Sclerophyllous vegetation	221 , 0 3	0.878%
324 : Transitional woodlands and scrublands	0, 4 4	0.001%
331: Beaches, dunes, sandy beaches	931 , 46	3.701%
411: Marshes inland	710 , 87	2.825%
511: Water corridors	1,880.1	7.471%
Total	**25,161.96**	**100%**

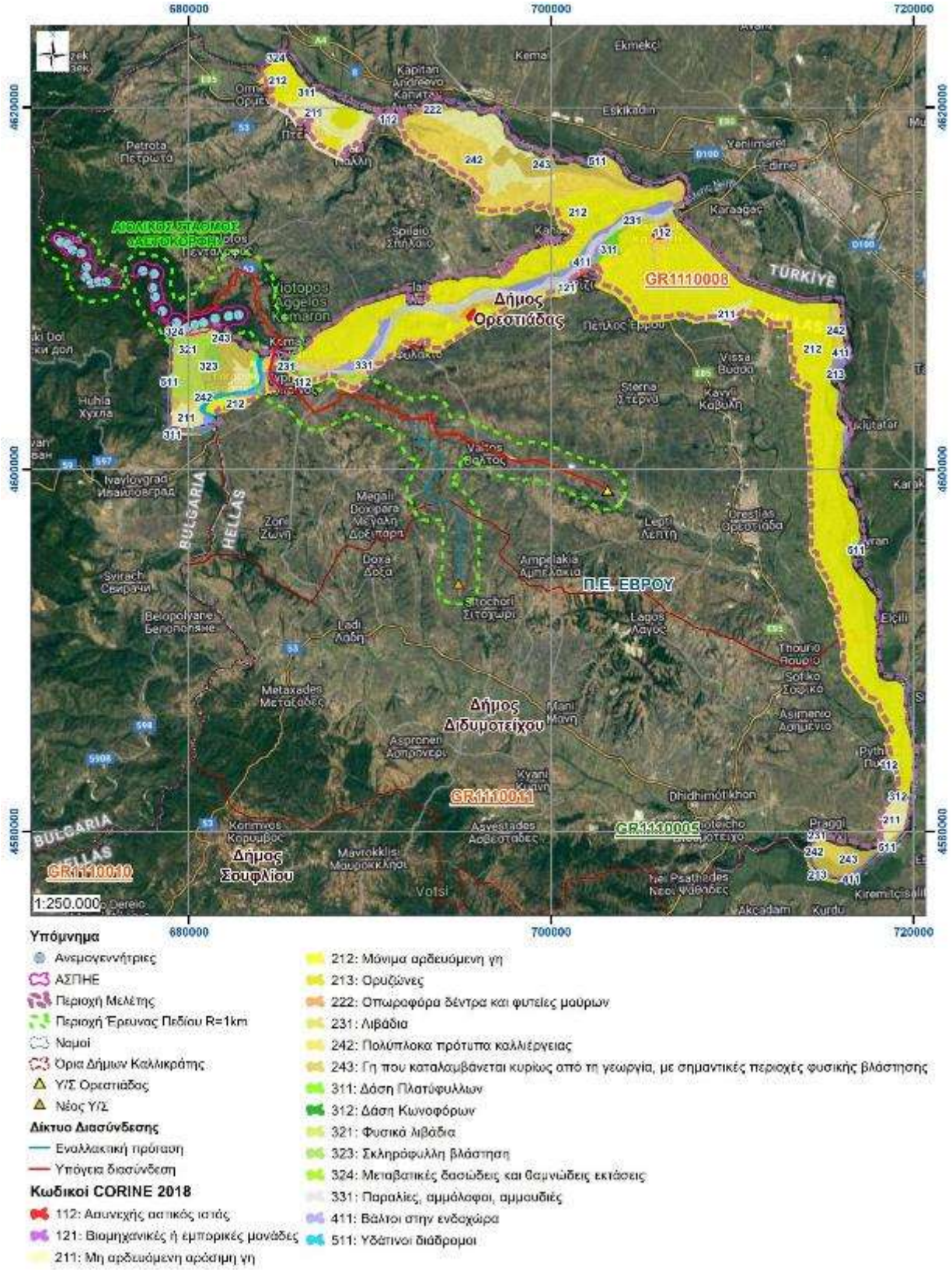

Figure 1-4 : Land uses in the Study Area based on the CORINE 2018 land use map

1.1.2. General Description of Vegetation S.A.

The wider area of Evros is an area with mountainous ecosystems of great national and international importance. It supports rich bird populations in terms of both numbers and diversity, including rare and endangered species.

In terms of phytosociological classification, the area of the project is located in the para-Mediterranean vegetation zone and is occupied by oak and other broad-leaved species forests, scrub, pine forests and reforestation with pine trees, as well as grassy areas. The locations of the wind turbines are located entirely in a forest ecosystem of oak and other broadleaved trees.

More specifically, the vegetation zones of the area are as follows:

A) Para-Mediterranean vegetation zone (Quercetalia pubescentis)

This zone starts from the lowest places at the foot of the Rhodope mountain range and reaches an altitude of 700-950m above sea level. The lower part of the zone, up to an altitude of 600m above sea level, shows a bushy physiognomy and belongs to the Ostryo-Carpinion subzone. The growth space Coccifero-Carpinetum is mainly encountered. The Carpinetum orientalis groblade area occurs only in a few places, in eastern and northern exposures, usually as a continuation of Coccifero-Carpinetum. The dominant woody species that make up the woody and shrubby vegetation in the subzone are: *Quercus coccifera, Carpinus orientalis, Ostrya carpinifolia, Fraxinus ornus, Juniperus oxycedrus, Acer campestre, Acer monspessulanum, Quercus pubescens, Hippocrepis emerus ssp. emeroides, Quercus frainetto* etc.

In very few small areas, near the foot of the western slopes, in a particularly dry climatic environment, the Cocciferetum groblade area appears. The rest of the para-Mediterranean zone is occupied by the Quercion confertae subzone, which usually reaches an altitude of 800 m above sea level and in southern exposures 950 m. It is mainly dominated by the species *Quercus frainetto, Quercus pubescens, while the species Quercus coccifera, Sorbus domestica, Acer campestre* etc. often appear. Finally, within this subzone (*Quercion confertae), in its northeastern part, individual individuals or groups of Pinus nigra* appear, at certain positions.

The results of the long-term and intense anthropogenic impact are very evident in the entire zone and especially in the lower subzone, where the woody vegetation appears, for the most part, in a bushy form or is completely absent. But the upper subzone also shows, in addition to the degradation to low forest, a strong fragmentation of meadows and crops.

B) Azonian riparian formations

Along the watercourses and bedrocks, the waterside and riparian habitats of hydrophilic vegetation species can be found. Hardwood broadleaf forests on most riparian areas are flooded during normally rising water levels or in low-lying areas that are inundated by rising water horizon. The soil can be well drained between water elevations or remain soggy following the water diet. The substrate is clayey or sandy and is formed by alluvial deposits. The maintenance of these forest ecosystems in these zones is due to the hydrofertilization and rapid decomposition of leaves and other organic residues. The occurrences of riparian forests (riparian, deltaic, estuarine and lakeside), in some cases, and mainly in the deltas of rivers and lakes, are remnants of more extensive and uniform forest formations of the past. Their presence is dependent on groundwater and they grow on smooth, flat sites subject to seasonal prolonged flooding (slopes).

Physiognomically, these alluvial forests are dominated by tall trees of *Populus alba* and/or *Salix alba* , *S. fragilis* (rarely pure or mixed stands of *Fraxinus angustifolia* , *Ulmus minor* and very rarely *Acer sempervirens*) and are multi-story structures. The stands are characterized by a tree floor of 6-8 m (-20 m) height (rarely up to 30 m), covering (20-) 60-100%, while most of the time two tree floors are observed, with *Populus alba* forming the upper floor and *Salix alba* in the mezzanine. The shrub floor shows highly variable coverage (5-85%), while the coverage of the herbaceous floor varies from 10-90%. The presence of many climbing species, such as the wild vine, *Vitis vinifera, is often important .*

Table 1.2. Vegetation zones and floors and corresponding types of vegetation in SPA GR 1110008.

VEGETATION ZONE	FLOOR OF VEGETATION	TYPE OF VEGETATION
Paramediterranean (Quercetalia pubescentis)	Mid-Mediterranean floor (280-950m)	Macchia vegetation *Quercus coccifera* . Forests *Quercus frainetto* .
Azonian riparian formations	Stream beds	Riparian forests and marsh vegetation

The project under study will be carried out in forest areas (wind turbines) with scrubland (interconnection cable), but also in rural areas (interconnection cable, New Substation), as shown in the relevant topographical diagrams.

In the study area, there are mainly forest partially degraded ecosystems, scrub maquis vegetation, pastures and a significant number of agroecosystems. The site of the wind turbines

varies in a range of altitudes, from 200 m (WT20) to 580 m (WT3) and the vegetation at these sites is entirely forested and consists of oaks and broadleaves. The bushes within which part of the area under study is located, consist of sclerophyllous, macchia vegetation. The majority of the cultivated land in the immediate study area concerns mainly annual crops (cereals, livestock, tobacco). Agricultural crops are mainly concentrated in continuous areas in the farms of the area (Trigono), where the smooth relief and small slopes combined with the deep soils of sedimentary rocks make them suitable for agriculture. In the area there are a large number of intra-river small-sized reservoirs, created by artificial embankments within the streambeds, used for crop irrigation.

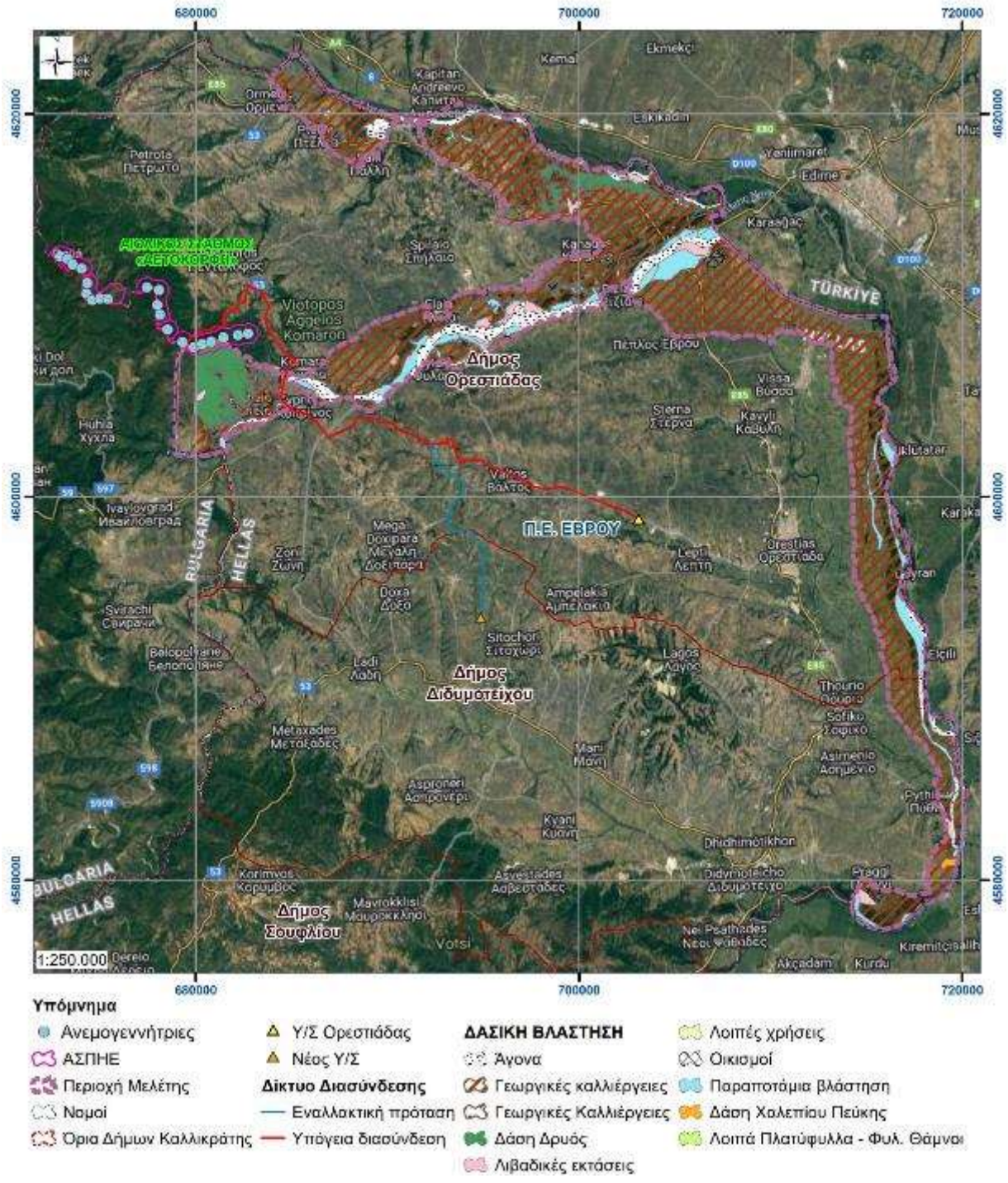

Figure 1-5. The vegetation in the Study Area - Area of the Natura 2000 SPA Network "Riparian Forest of Northern Evros and Arda" (GR 1110008 SPA)

1.1.3. Description of Habitat Types S.A. – GR1110008

The habitat types listed and described below are the product of photo interpretation and field data processing, as there are no officially recorded Habitat types in the SPA areas. The recording of the present types of habitats in the area of the SPA "Riparian forest of northern Evros and Arda" (GR 1110008 SPA) was based on the following available sources:

- On the forest cover map of Greece (Ministry of Environment).
- In the Photointerpretation of the SPA area "Riparian forest of northern Evros and Ardas"
- In "Identification and description of habitat types in areas of interest for nature conservation" (1999-2001), (Y.PE.HO.DE, 2001) [1].
- SDF sheets of the NATURA 2000 area .

Annex I of Directive 92/43/EEC includes the following habitat types of the Study Area: 9540 "Mediterranean pine forests with endemic Mediterranean pine species", 3130 "Stagnant, oligotrophic to mesotrophic waters with Littorelletea uniflorae and/or Isoëto vegetation - Nanojuncetea", 3140 "Hard oligo-mesotrophic waters with benthic vegetation of charoid formations with *Chara* spp", 3150 "Eutrophic natural lakes with vegetation of the Magnopotamion or Hydrocharition type". 3260 "Ranunculion fluitantis and Callitricho – Batrachion type spring vegetation", 3280 "Mediterranean rivers with a permanent flow of Paspalo - Agrostidion and dense curtain vegetation of *Salix* and *Populus alba* on their banks", 3290 "Mediterranean rivers with periodic flow from Paspalo – Agrostidion", 91 F 0 "Forests of Platanus orientalis / and Liquidamar orientalis (Olatanion orientalis)", 91M0 – "Pannonian – Balkan forests of Turkish oak – common oak", 92A0 "Forests – galleries with Salix alba and Populus alba", 92 C 0 "Mixed oak-elm-fruct forests" and 9540 - "Mediterranean pine forests with endemic Mediterranean pine species". The types of habitats that can be distinguished in the Study area are the following:

[1]It is noted that during the preparation of this SEA study, the most recent mapping of habitat types in the study area was not available as part of the project: "Development of a Large Scale Spatial Data Infrastructure (1:5,000) for Terrestrial Protected Areas of the Natura 2000 Network / EKXA SA".

Table 1-3. Types of habitats in S.A., SPA GR 1110008

HABITAT DESCRIPTION	HABITAT CODE	% COVERAGE
(N 04) Coastal dunes, Sandy beaches, Mediterranean pine forests with endemic Mediterranean pine species	9540 (Appendix I, Directive 92/43/EEC)	3
(N 06) Internal water bodies (stagnant water, floblade water), (N 10) Wet grasslands, Mesophilic grasslands, Stagnant, oligotrophic to mesotrophic waters with Littorelletea uniflorae and/or Isoëto – Nanojuncetea vegetation, Hard oligo-mesotrophic waters with benthic vegetation of charoid formations with *Chara* spp. Eutrophic natural lakes with Magnopotamion or Hydrocharition type vegetation , Vegetation sources type Ranunculion fluitantis and Callitricho – Batrachion, Mediterranean rivers with a permanent flow of Paspalo - Agrostidion and dense vegetation in the form of a curtain of *Salix Populus alba* on their banks, Mediterranean rivers with periodic flow from Paspalo - Agrostidion	3130 (Para. I, Directive 92/43/EEC), 3140 (Para. I, Directive 92/43/EEC), 3150 (Para. I, Directive 92/43/EEC), 3260 (Para. I, Directive 92 /43/EEC), 3280 (Para. I, Directive 92/43/EEC), 3290 (Para. I, Directive 92/43/EEC)	4+7
(N 12) Extensive cereal crops (including rotational crops with regular fallow) (N15) Other arable land (N 21) Non-forest areas cultivated with woody plants (Fruit orchards, vineyards)	1020	(15+42 +3)
(N 08) Heaths, scrub, maquis vegetation, Garrigues vegetation , phrygana, Pseudomaqui	934A , 5350	3
(N 16) Broadleaf deciduous forests, Forests – galleries with Salix alba and Populus Alba , Mixed forests oak – elm – ash Forests *Platanus orientalis* ¨ the / and *Liquidamar orientalis* (Olatanion orientalis), Pannonian - Balkan forests of Turkish oak - common oak	92 A 0 (Para. I, Directive 92/43/EEC), 92C0 (Para. I, Directive 92/43/EEC), 91 F 0 (Para. I, Directive 92/43/EEC), 91M0 (Para. I, Directive 92/43/EEC)	1
(N 23) Other uses (Cities, villages, roads, barren, bare)	1050	22
Total		**100**

It is noted that the above table also includes the non-natural / man-made habitat types with codes **1020** (agricultural crops) which in the study area mainly includes grains, fruit and vegetables and legumes, but which has been abolished and is not included in the habitat types of the final list of the National Implementation Report because it does not correspond to any

habitat of Annex I of Directive 92/43/EEC and is not consistent with the objectives of monitoring and evaluating the conservation status of habitat types (Dimopoulos et al., 2014).

Habitat type **3130** includes oligotrophic to mesotrophic backwaters of subalpine plains of the continental and Alpine regions and in mountainous areas of other regions, with vegetation belonging to the Littorelletea uniflorae and / or Isoteo – Nanojuncetea . Habitat type 3130 is found in loamy-sandy substrates formed by alluvial fluvial and lacustrine deposits. The lands are generally flat, at a low altitude (~80 m). The most important and characteristic species of the habitat type are: *Agrostis stolonifera , Alopecurus aequalis , Amaranthus albus , Amaranthus blitoides , Amaranthus blitum , Bidens tripartitus , Dysphania botrys , Oxybasis glauca , Chenopodiastrum opulifolium , Crypsis schoenoides , Cynodon dactylon , Cyperus fuscus , Cyperus laevigatus , Digitaria sanguinalis , Echinochloa crus – galli , Eragrostis minor , Isolepis setacea , Juncus articulates , Leonurus cardiaca , Lindernia dubia , Nymphoides peltate , Paspalum dilatatum , Paspalum paspalodes , Persicaria lapathifolia , Persicaria maculosa , Polygonum aviculare , Portulaca oleracea , Rorippa sylvestris , Silene Fabaria .* The threat to the habitat type is water pollution, which can come from agricultural or industrial use.

Habitat type **3140** includes lakes and ponds with waters very rich in dissolved bases (pH often 6-7) or mostly very clear waters bluish to greenish, poor (to moderate) in nutrients and rich in bases (pH often > 7.5). The bottom of these unpolluted waters is covered with charophytes, *Chara* and *Nitella* and algal mats. Habitat type 3140 is commonly found in carbonate-rich karst lakes with species of the genus Chara . The habitat occurs over a considerable area in shallow waters where the depth is not greater than 1 m . The present communities have a small area but are important for the biodiversity of the habitats in which they grow, as their characteristic species may not be found in other places in the wider area. They usually grow in small shallow reservoirs with seasonal fluctuations in water level. These ponds are interesting because they host remarkable species from a phytogeographical point of view that grow not only in the water, but also in the moist soils, on the banks. Freshwater habitats are generally considered threatened at European level. Charophyce communities are generally susceptible to pollution of the habitats in which they grow, but also to changes in conditions resulting in the evolution of vegetation. Usually, the presence of well-developed species-rich societies is indicative of the cleanliness of the waters. The most important and characteristic species of the habitat type are: *Bromus hordeacus , Carex divisa , Chara* sp *., Chara vulgaris* , *Cladophora* sp ., *Echinochloa* sp ., *Eleocharis palustris* , *Geranium dissectum* , *Juncus bufonius , Lythrum* junceum , Myriophyllum spicatum , Nasturtium officinale , Orchis sp ., Phragmites australis ,

Polygonum sp ., *Stuckenia pectinate* , *Potamogeton* sp ., *Ranunculus* sp ., *Ranunculus neapolitanus , Ranunculus muricatus , Ranunculus rionii , Ranunculus trichophyllus , Trifolium resupinatum , Veronica anagallis - aquatica .*

Habitat **3150** includes gray to bluish-green, more or less turbid lakes with dirty water particularly rich in dissolved bases (pH usually >7) with free-floating societies of Hydrocharition or in deep open water with communities of large lake species (Magnopotamion). The habitat is found in sheltered locations, usually in the middle sub-coastal zone, where the waters are 1 to 3 m deep and the substrate is silty to sandy loam, formed from alluvial deposits. It includes species-poor communities of nymphaeiform plants with large floating leaves and impressive flowers. It is one of the most important inland water habitats, which is an important habitat for macrozoobenthos and amphibians that support the food chain. The submerged aquatic vegetation is part of the wetland ecosystems and the ecological processes that take place with them and its presence is an indicator of their good functioning. Some of the characteristic species of the habitat are: *Helosciadium nodiflorum , Callitriche stagnalis , Carex divisa , Ceratophyllum demersum , Ceratophyllum submersum , Eleocharis palustris , Hydrocharis morsus – ranae , Juncus subulatus , Lemma gibba* etc.. It is threatened by grazing in riverbeds, over-pumping of water and river alignment and settlement projects. Water pollution, pesticides and drainage are also threats to the habitat.

Habitat type **3260** occurs in riverbeds, plains up to higher elevations in mountains, with submerged or floating Ranunculion vegetation fluitantis and Callitricho – Batrachion (low flow during summer) or presence of aquatic mosses. The vegetation that characterizes habitat type 3260 grows in shallow waters, even seasonal marshes, mainly in silty-clay bottoms and consists of few plant species. They respond to floblade (low-flow) water along canals, in places not covered by reedbeds, in marshy areas, in small rivers, in eutrophic small ponds, and in small lakes and canals. The importance of the habitat lies in the fact that it is a habitat for protected species of fauna (e.g. water turtle) and is an indicator of the quality of running water. The most important and characteristic species of habitat type 3260 are: *Chara* species , *Lepidium coronopus , Cyperus longus subsp . Badius* . The habitat type is threatened by the reduction of water flow (irrigation), but also by water pollution and grazing.

Habitat type **3280** is dominated by nitrophilous annual and perennial grasses and sedge formations on the alluvial banks of large rivers. Habitat type 3280 is characterized by plant communities on the banks of streams, rivers or on islands, with sandy or sandy loam soil, located in or near the bed. Permanently floblade rivers can be sometimes rapid and sometimes gentle. Their width is usually small, a few meters, while their length often approaches several

km with many branches in between. They have narrow beds, specific vegetation units are formed with nitrophilous annual and perennial grasses and grasses, as well as dense vegetation in the form of a curtain of *Salix Alba* . They grow not only along the bank, but also in flood zones plains) of rivers. A few from the characteristics items of type habitat is the : *Agrostis stolonifera, Alisma plantago – aquatica, Amaranthus albus, Amaranthus retroflexus, Artemisia vulgaris, Atriplex prostate, Bidens* species *, Bidens tripartitus, Centaurium tenuiflorum, Dysphania pumilio, Cyperus fuscus, Digitaria sanguinalis, Echinochloa crus — galli, Eleocharis palustris, Equisetum arvense, Eragostis minor, Eragostis Pilosa, Paspalum distichum, Rorippa sylvestris, Veronica anagallis* – aquatica etc. l . e .. The habitat type is threatened by human activities (recreation, sand dunes, camping and others).

The habitat type **3290** is found in riverbeds, with an irregular shape along the length, where a periodic flow of water is observed, as in the summer months the existence of a dry bed in places and in a few cases the existence of residual cavities with water is observed in most of the river. The substrate was formed by river sediments, with silty-sandy soil. It is found in flat areas below 600 m . In terms of vegetation, the societies of Paspalo – Agrostidion mainly appear . Freshwater habitats are generally considered threatened at European level. It is known that plant communities of aquatic macrophytes contribute significantly to the productivity of lakes and regulate at least partially the entire metabolism of water bodies. Submerged aquatic vegetation is part of wetland ecosystems and the ecological processes that take place in them, and its presence is an indicator of their good functioning. Some of the characteristic species of the habitat type are: *Apium nodiflorum , Cyperus fuscus , Dorycnium rectum , Equisetum* species *, Juncellus laevigatus* subsp *. Distachyos, Lythrum junceum, Melilotus* species *, Mentha* species *, Nasturtium officinale, Parietaria* species *, Paspalum distichum, Paspalum* species, *Persicaria maculosa, Picris* species *, Poa annua, Polygonum amphibium, Ranunculus muricatus, Rumex* species *, Veronica anagallis – aquatica* K . l . p .. The plant communities of habitat type 3290 present a fragmented appearance and incomplete composition due to the various forms of land use (irrigation, crops, residential development, etc.). It is threatened mainly by the disturbance of the hydrological cycle and by the evolution of the vegetation.

Habitat type **5350** includes scrub formations, between evergreen broadleaf scrub (maquis) and Balkan deciduous broadleaf scrub (schibljak), created by the degradation of Ostryo - Carpinion in the Balkans and Italy, with a mixture of evergreen and deciduous species (shrubs). The most important and characteristic genera of this type are: *Quercus coccifera , Acer*

campestre , Carpinus orientalis , Silene italic , Juniperus oxycedrus , Fraxinus ornus , Ostrya carpinifolia .

Habitat type **91 F 0** includes mixed riparian forests with *Quercus robur , Ulmus laevis* and *Ulmus minor , Fraxinus excelsior* or *Fraxinus angustifolia* , usually along rivers. These are forests of hardwood trees (broadleaves), in most of the riverbanks, subject to flooding (subsidence) during normally rising water levels, or low-lying areas subject to subsidence due to the elevation of the aquifer level. Forests grow on recent alluvial deposits. Forests are usually in flat areas. The particularity and importance of this wetland type of habitat lies in the very tall trees of the species. Quercus robur ssp . Penduculiflora , in the general ecological importance and in the important functions of all riparian forests and of course in its residual character which highlights it in one of the few examples of the presence of this type of forest in Greece. Some of the species characterizing the habitat type are: *Alisma glutinosa , Arctium lappa , Aristolochia clematis , Ballota nigra , Brachypodium sylvaticum , Clematis vitalba , Cornus sanguinea , Equisetum telmateia , Eupatorium cannabinum , Fraxinus angustifolia , Hedera helix , Holcus lanatus , Humulus lupulus , Iris pseudacorus , Juglans regia , Leucojum aestivum , Lycopus europaeus , Lythrum salicaria , Mentha aquatic Oenanthe fistulosa , Periploca graeca , Populus alba , Quercus robur , Ulmus minor , Ulmus procera , Urtica dioica* etc.. The biggest risk for the 91 F 0 habitat is the change in the water diet and mainly the non-inundation by flood waters and the lowering of the groundwater level due to river bed arrangements.

Habitat type **91 M 0** (which completely replaced 924A) includes thermophilic oak forests of *Quercus species pubescens* sub *sp . pubescens , Carpinus orientalis , Carpinus betulus , Ostrya Carpinifolia .*

Habitat type **92A0** includes riparian forests - galleries, dominated by willow and poplar species. The characteristic presence of many species of climbing plants creates a complex structurally ecological environment. These forests provide a variety of ecosystem services, stabilizing the banks, filtering pollutants before they enter the water body and creating, through the shading they provide and the dead material they dump into the water bodies, suitable microhabitats for the fauna of rivers and streams. streams. They are also often 'ecological corridors' for wildlife, connecting natural areas in the often fragmented lowland landscape in which they occur. They also provide a high aesthetic value, being a pole of attraction for recreation. It is usual to layer the floor of the trees in two heights. The upper one is dominated by poplar species and the lower one by willow species. Shrub and herbaceous understoreys show a wide range in cover, depending on light conditions within stands. In these forests the most common species are:

Salix alba , S. fragilis , S. eleagnos , S. purpurea , Populus alba , Fraxinus spp *., Alnus glutinosa , Clematis vitalba , Vitis vinifera , Cynanchum acutum , Periploca graeca , Hedera helix , Smilax aspera , Humulus lupulus , Solanum dulcamara , Urtica dioca , Agrostis stolonifera* . The conservation status of the habitat type is deemed insufficient according to the 3rd six -year reference report in application of Article 17 of Directive 92/43 on habitats, with a tendency to remain stable. The main existing pressures identified for the habitat type include cultivation, understory cutting, grazing, tree planting, unsustainable management, the existence of quarries, the presence of roads, proximity to settlements, sewage discharge, etc. a..

Habitat type **92 C 0** includes forests colonizing slightly stabilized river deposits, colluvium, gravel, springs, as well as at the base of deep steep shady canyons, with the creation of species-rich plant communities. The *Platanus* forests *orientalis* are a characteristic type of riparian Mediterranean vegetation. They mainly accompany permanently floblade rivers or small mountain streams and their presence depends on groundwater. They grow in a wider range of ecological conditions than *Salix – Populus* forests but need more humid sites than Nerio – Tamaricetea communities . Their ecological value is great due to the functions they perform, with the most important among their functional benefits being anti-corrosion capacity, stabilization of banks, retention of water and solid materials, maintenance of soil quality, maintenance of interclimatic conditions. In terms of biodiversity, their value lies in the habitat they provide (they are unique habitats for a multitude of animal species as well as hygrophilous plant species), the corridor position they have in the landscape, the contribution to the mosaic of the landscape. In addition, the aesthetic and recreational value of sycamore forests should be noted. Some of the characteristic species of the habitat type are: *Agrostis* sp . *, Alnus glutinosa , Arum italicum , Brachypodium sylvaticum , Carex pendula , Celtis australis , Clematis vitalba , Equisetum arvense , E. ramosissinum , E. telmateia , Geranium robertanium , Hedera helix , Juglans regia , Melissa officinalis , Mycelis muralis , Nerium oleander , Platanus orientalis , Pteridium aquilinum , Rubus sanctus , Symphytum bulbosum , Vitex agnus – castus* etc.. Habitat type 92 C 0 includes communities that depend on the permanent presence of water and are sensitive to changes in the hydrological situation (irrigation projects, water supply projects, settlement of streams) and water pollution, activities that are constantly intensifying without taking measures to reduce their effects. Water pollution can cause degradation of the flora composition, as can other activities such as grazing, adjacency to crops and waste deposition.

Habitat type **9540 includes the forest formations of thermophilic pines of the Mediterranean region,** *Pinus* species *Pinea* (Koukounaria) *Pinus halepensis* and *Pinus brutia*

(tracheal pine). The plantations of pines (mainly pine) since ancient times do not allow the distinction of natural and artificial forests, for this reason and old plantations (reforestations) of these species are also included here, within their natural distribution zone and in which the composition of the understory is the same as that of natural forests. Halepium and trachea pine forests grow in shallow soils, rarely in moderately deep soils. In terms of soil composition, they prefer soils of medium composition, sandy loam, clay. The gradients range from moderate to very strong. They are found in coastal areas inland from sandy beaches and on mountain slopes up to an altitude of 100 m. Usually the understory is dense and consists of evergreen broadleaves of the eumediterranean zone. The understorey may consist only of bryophyte species in the case of degraded, overgrazed stands, or be practically non-existent in the case of artificially reforested or resinous forests. Natural regeneration of Scots pine and Scots pine forests is very difficult. Regeneration usually occurs after a fire, which causes mass germination of the seeds of the above-ground bank (seeds protected in closed cones). The value and importance of pine forests is multiple and refers to aesthetics, hydrological value, value for recreation, their regulatory role in the microclimate and pollutants, and finally soil protection. The main risks for thermophilic pine forests (scotch pine, trachea and halepi pine) come from forest fires, the expansion of crops, their encroachment and land consolidation, and the evolution of vegetation.

The Greek habitat type **934A** includes tree formations dominated by holly (*Quercus coccifera*), sometimes in combination with aria (*Q . Ilex*). In some places remnants of heather forests appear, especially around old chapels, while new ones are forming where grazing has been abandoned. Other species that occur in this habitat are: *Pistacia lentiscus , Clematis cirrhosa, Arbutus unedo , Crataegus monogyna , Acer sempervirens , Erica manipuliflora , Cistus creticus , Calicotome villosa , Coridothymus capitatus , Prasium majus , Genista acanthoclada , Hypericum empetrifolium.* The heather forests are generally in good to moderate conservation status, mainly affected by the intensity of grazing.

Agricultural crops (code 1020) include the following categories: wheat, other grains, cotton, fallow, animal feed, other forest tree crops, irrigated maize, oilseeds and sugar beets (7/1/2013) .

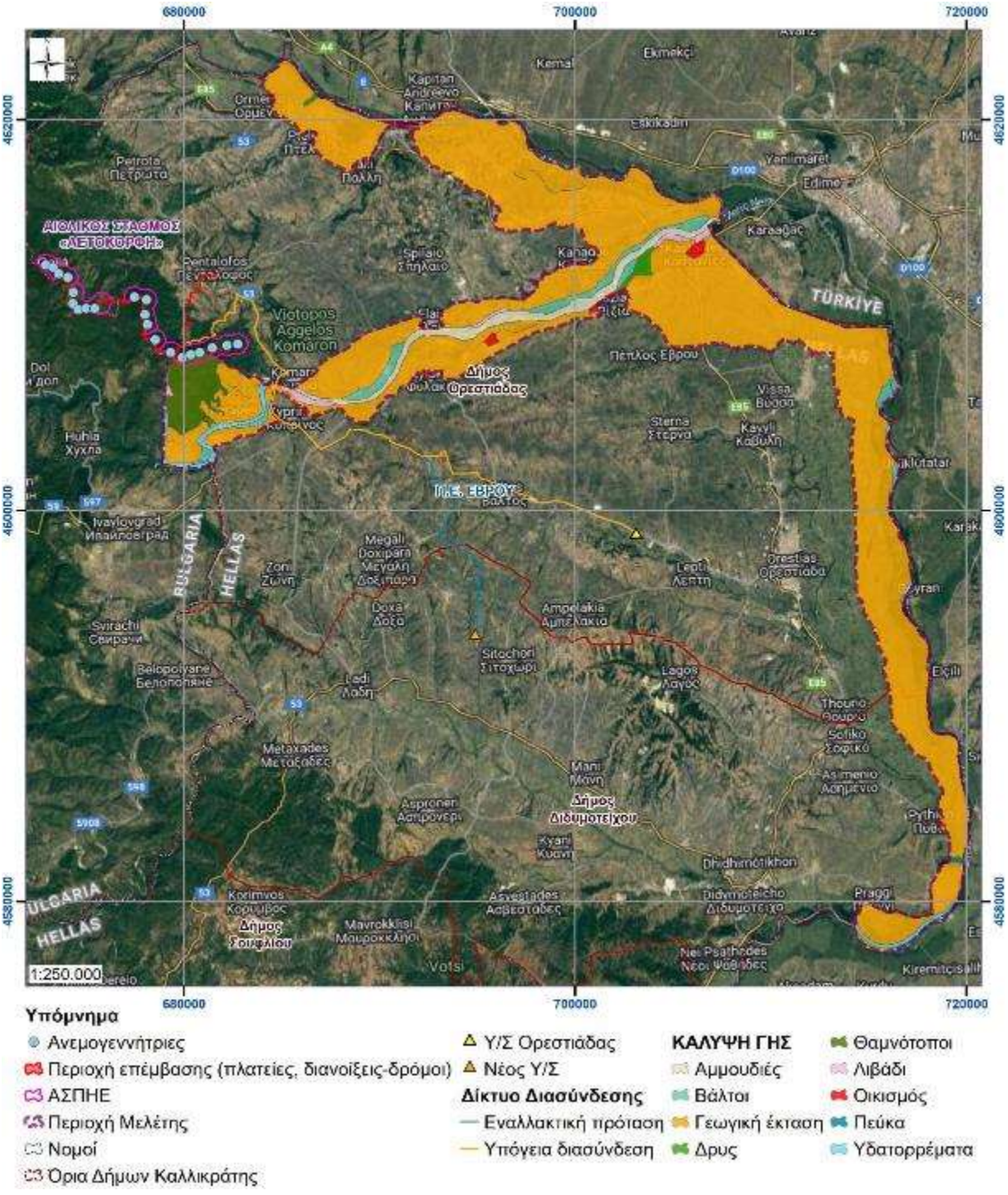

Figure 1-6. Spatial distribution of first stage, land uses and vegetation in the Study Area, GR 1110008

1.1.4. Poultry in S.A.

The Study Area is important for breeding and wintering raptors, waterfowl, endemic and migratory species.

The river Ardas is one of the richest biotopes in terms of bird fauna. The forests of the river offer the necessary cover and the possibility of nesting for dozens of species. Among the predators, spotted eagles, golden eagles, falcons, reed harriers, winter harriers, meadow harriers, tsiftes, shrikes, rare sables and diplosaena live here, tree herons, dwarf herons and kestrels that hunt in the surrounding fields. Close to the banks, rare black storks are found, but also many white storks. The riverbed is home to gray herons, purple herons, little herons, night ravens, great egrets, white herons, cormorants, warblers, sandpipers, redshanks, woodpeckers, wagtails, coots, snipe, little chickadees, grebes, pygmy grebes and rare kelp. Among the smaller species that live near rivers, one comes across many waterbirds (kalamopotamids, valtopotamids, gumdropotamids, schinopotamids, psathopotamids), kingfishers, terns, cuckoos, various ostriches, nightingales, susourades, etc. Among the birds of the fields and fields, there live starlings, meadow coots, gray herons, gray herons, barn swallows, little galliandras, scurfs, common wagtails, bee-eaters, wagtails, wagtails, vine-growers, reed warblers, eagle-owls, swallows, swallows, trigons, thrushes, etc. .a .

The area of Evros is covered in a percentage of 70.17%, by agricultural crops, based on the categorization made in Corine 2018. Agricultural ecosystems have the greatest biodiversity of the rest at a pan-European level. This is due to the size of the cultivated areas (Schoener 1976, Wiens 1989). A field maintains habitat mosaics of different crops, fallows, natural hedgerows, irrigation canals and small ponds. Species richness is linked to these elements. Thus the total biodiversity of a given area may be a consequence of the habitats it includes and the diversity of the habitats it contains.

The avifauna of the fields is characterized by the presence of waterfowl and waterfowl, both due to the difference in feeding and breeding habitats, and the fact that many of them are migratory and use the fields as intermediate stations during their migration. Of the 215 species of birds found in this ecosystem, 109 are waterfowl and waterfowl, which use the area for nesting, feeding and resting during their migratory journey. The avifauna includes other species such as raptors (30 species) of the family Acciptridae, such as white-tailed eagle (*Milvus milvus*), golden eagle (*Aquila crysaetos*), falcons (*Buteo rufinus*), aetogeraquins (*Buteo buteo*), serpent eagles (*Circaetus* galli cus) and various species of circuses (*Circus* sp.) and falcons (occ. Falconidae), osprey (*Pandion haliaetus*) and nocturnal raptors (www.

anhma.gr , www.wetlands.org . Fasola & Ruiz 1997). Quantitative information exists for herons (Fasola et al. 1996), as well as for large concentrations of storks in the area of agricultural ecosystems. Other species, ostriches that use the habitat either for feeding or for nesting, are the following: the coot (*Vanellus vanellus*), the quail (*Coturnix coturnix*), the gorse (*Otus scops*), the Balkan woodpecker (*Dendrocopos syriacus*), the cross-necked (*Jynx torquila*), the cassowary (*Galerida cristata*), the wheatgrass (*Alauda arvensis*) the yellow shrike (*Motacilla flava*), the donkey's head (*Lanius minor*), the redhead (*Lanius senator*), the double-headed (*Lanius excubotir*), the black-backed (*Certhia brachydactyla*), the sea urchin (*Emberiza cirlus*), the reed gum (*Emberiza schoeniclus*), the goldenrod (*Emberiza citronella*), the vlachos (*Emberiza hortulana*), the goldfinch (*Carduelis carduelis*), the house sparrow (*Passer hispaniolensis*), the starling (*Sturnus vulgaris*) and the crow (*Corvus monendula*).

Canals adjacent to agricultural ecosystems in combination with agricultural land provide foraging habitat for aquatic species such as the common eel (*Phalacrocorax pygmeus*), the stork (*Ciconia ciconia*) and the black squirrel (*Ciconia nigra*). As the presence of the water element increases and the area tends towards the aquatic ecosystem, the presence of other epidemic or migratory species is also identified such as: the night raven (Nycticorax , nycticorax), the nano scale (*Calidris minuta*), the petrel (*Burhinus oedicnemus*), the fighter (*Philomachus pugnax*) etc.

Natural fences house the largest number of breeding birds of all other agricultural land structures. For this reason their existence is the most important factor in determining the number of existing birds. In winter, the same applies to wintering birds. The fences constitute narrow corridors and therefore their total area cannot be determined. Birds use them for many different purposes. Some species use them for nesting, others for overnight sites and many species of birds use them to find food as they host a multitude of invertebrates and fruits. Some of the forest and ostrich species that use the hedgerows and the scrublands in general are the following: the quail (*Coturnix coturnix*), the fassa (*Columba palumbus*), the eagle fighter (*Lanius collurio*), the donkey-head (*Lanius minor*), the double-headed (*Lanius excubitor*), the troglodytes (*Troglodytes troglodytes*), the snipe (Gallinago gallinago), the blackcap (*Sylvia atricapilla*), the flycatcher (*Muscicapa striata*), the robin (*Erithacus rubecula*), the thrush (*Turdus philomelos*), the blackbird (*Turdus merulla*), the turdus (*Turdus viscivorus*), the Aegithalos (*Aegithalos caudatus*), the monk (Parus major), the blue heron (*Cyanister* / *Parus caeruleus*), the bittersweet (*Emberiza cirlus*), the goldenrod (*Emberiza citronella*), the vlachos (*Emberiza hortulana*), the finch (*Fringilla coelebs*), the tree sparrow (*Passer montanus*), the magpie (*Pica pica*) and the coruna (*Corvus corona*).

Therefore, the Study Area is part of the mosaic of areas of special ornithological importance. The correlation and interdependence of the Protected Areas of the wider Region of Macedonia - Thrace is of great importance, as while each one is individually important for a part of flora and avifauna, all of them together form a system of international importance for the living and preservation of many living organisms.

Below are the species characterizing the study area , as well as the conservation status of the population based on the **Red List of Threatened Species IUCN** .

Characteristic species of the area GR 1110008 Riparian forest of northern Evros and Ardas, according to the " National list of protected species" (2010) [2]:

***Dendrocopos syriacus* :** Balkan cheblade gum ,Least Concern, Population Trend : Stable (IUCN Red List Category and Criteria, 1/9/2016)

Lanius minor : Crested , Least Concern, Population Trend : Decreasing (IUCN Red List Category and Criteria, 1/9/2016)

Nycticorax nycticorax : Night raven ,Least Concern, Population Trend : Decreasing (IUCN Red List Category and Criteria, 1/9/2016)

Phalacrocorax carbo sinensis *:* Cormorant , Least Concern, Population Trend : Increasing (IUCN Red List Category and Criteria, 09/008/2018)

Important Bird Areas

In addition, the study area is **an Important Bird Area IBA,** according to **Bird Life International.** Below are its basic elements, while the table with the important migratory species follows:

Area code : **GR 001**

Official Name : **Riparian forest of northern Evros and Arda**

Regional Unit: Evros

Region: Eastern Macedonia - Thrace

Criteria : A 1, B 2, B 3, C 1, C 6

Coordinates : 41 ° 36' 2.665" N, 26 ° 26' 58.774" E

[2] These items are referred to in Article 4 of Directive 2009/147/EU and Annex II of Directive 92/43/EU.

Altitude : 0-157 m

Area : 18,905 ha

Description of the Area : The area extends along the rivers Evros (from Pythio to Ormenio) and Ardas (from Marasia to Kyprinos). The riparian forest consists of poplars (*Populus* spp .), willows (*Salix* spp .) and alder (*Alnus* spp .). The forest coexists with a mosaic of meadows, scrub, small freshwater lakes with reeds (*Phragmites* spp .) and agricultural areas with natural hedges. A large part of the area is a military zone.

Habitats : Artificial landscapes make up 81.6%, wetlands (inland) 11.7%, meadows and pastures 1.2% and forests 0.9%.

Bird fauna : Important area for breeding and migratory and less so for wintering aquatic, predatory and ostrich species. Within the area there are two heron colonies with *Nycticorax nycticorax, Egretta garzetta* and *Ardea cinerea* . The area has perhaps the highest density and population of *Coracias garrulus* in Greece, which is estimated to be due to the large and over-mature trees, the lack of disturbance and the high productivity of the ecosystem.

Table 1 -4. Information on the ornithological importance of the GR 001 area and data on species with a significant proportion of populations passing through the migratory route[3]

Species	Presence status	Min	Max	Abundance	Criteria
Ciconia nigra / Black stork	B			C	
Ciconia ciconia / Stork	B	53	53		
Nycticorax nycticorax / Night raven	B	95	267		B2, C6
A rdea cinerea / Cinderella	B	48	48		
Egretta garzetta / Lefkochiknias	B	57	57		
Microcarbo pygmaeus / Lagona	W	40	0		A1, C1
Falco vespertinus	B			P	
Milvus migrans / *Ciftis*	B			P	
Circus aeroginosus / Kalamokirkos	B			P	
Circus macrourus / Stepopirkos	P			P	

The criteria met by each type of designation in the IBA according to the 2000 assessment (Heath and Evans, 2000) are listed.

Species	Presence status	Min	Max	Abundance	Criteria
Accipiter brevipes / Saini	B	20	0		B2
Clanga pomarina / Howling eagle	B			P	
Clanfa clanga / Spotted Eagle	W			P	
Aquila heliaca / Golden eagle	W			R	
Gallinago *media*	P			P	
Coracias garrulus	B	50	0		
Alcedo atthis / Alcyone	B			P	
Dendrocopos syriacus / Balkan gum tree	R			C	B3, C6
Lanius minor	B			C	B2, C6
Sylvia nisoria	B			P	
Ficedula semitorquata / Patsalomandou	P			P	
Falco naumani / Kirkenes	B	11	11		

Presence status : P = permanent, R = rare, B = breeding, W = hibernating / overwintering
Abundance : C = common, R = rare, V = very rare, P = present

Conservation issues - Threats to the Important Area : The main threats are river pollution and toxic waste, uncontrolled landfills, fires, construction of dams for water management, desiccation of land, abandonment of traditional land uses, risk of flooding , poaching, hunting disturbance and destruction of foraging, roosting and nesting habitats, mainly by removal or burning of trees.

The above mentioned threats are more related to the Ardas River, while the environmental situation along the Evros River is not threatened by habitat changes, as it is a military zone. It does not foresee changes of land use and access and human activities are prohibited. Farmers and breeders are employed in the area.

1.1.5. Sensitive Species - Endangered Bird Species in S.A.

Central and Eastern Macedonia has perhaps the greatest density of breeding Golden Eagles and therefore the actions will be focused on the protection and conservation of this species. Specifically, there will be actions for the installation and operation of a Carnivore Birds of Prey Feeding Area (FAP), as well as telemetry actions aimed at monitoring the species with satellite transmitters.

***Clanga (Aquila) clanga* – spotted eagle**

Red book : International – VU , Europian – EN , National - EN

Of the remaining species, the spotted eagle is a regular winter visitor, with good populations in large wetlands, but is considered a vulnerable species due to its dependence on wetlands and adjacent forested areas. It winters in the large wetlands of northern and central Greece, with larger populations in the Evros Delta (and neighboring hills), Amvrakikos, L. Kerkini and the Nestos Delta, while it is very rarely observed in more southerly areas. Its annual wintering population averages 70-80 individuals, 80% of which are young and immature birds. The maximum population of the species in Greece (47 individuals) was recorded on perches in the Evros Delta in 2008. (Handrinos 1992, Handrinos & Akriotis 1997, EOE unpubl. data, Evros Delta Information Center unpubl. data). An individual ringed in Greece was found in Latvia (Akriotis & Chandrinos 2004). About 50% of the population that winters in the Balkans is in Greece. It is found almost exclusively in large wetlands that have riparian forests, stands of large trees, etc. or that are adjacent to wooded hills, where it roosts, often with other eagle species . It feeds mainly on waterfowl , often injured by hunters, and more rarely on other vertebrates, large insects and even carnivores (Alivizatos et al. 2004, Alivizatos et al. 2006).

Threats: The main threats to the species are wetland degradation, deforestation of large stands and clearing of lowland/riparian forests. Locally the species is also threatened by disturbance, poaching, lead shot poisoning and perhaps poisoned baits.

Existing conservation measures : This is a protected species, like its entire wintering population in Greece, it is found in areas of the SPA/Natura 2000 network.

Conservation measures needed: Better protection of roosting sites is needed, especially in the Evros Delta, where most of the wintering population is concentrated, as well as protection of feeding areas. Control of the illegal use of poisoned baits and poaching is also required, combined with a ban on the use of lead shot in wetlands.

***Clanga (Aquila) pomarina* – Shrike**

Red book : Internatiola – LC, National – EN

The bald eagle is fairly common, locally a rather common summer visitor and passing migrant in GREECE. A much more common species and with a wider distribution in pre-war years, today it nests in Thrace, Macedonia, Thessaly and Epirus (until recently it also nested in Central Greece) (Handrinos & Akriotis 1997). The breeding population in Greece is estimated at 67-90 pairs. (the majority of which in N. Evros), with decreasing trends (Handrinos 1992, Handrinos & Akriotis 1997, BirdLife International 2004, EOE adim. data, Papandropoulos

personal assistant). More widespread during the autumn migration, when several isolated, mainly young individuals are observed in the S-SW Peloponnese, in Crete, etc. Four buzzards ringed in Slovakia (2), Germany and Poland were found in Heraklion, Crete, Zakynthos, Aegina and Corinth (Akriotis & Handrinos 2004). The population of Greece constitutes 1% of the European population. An eagle with a fairly specialized habitat, it lives in lowland and semi-lowland forests (nests in trees), but always in the vicinity of freshwater wetlands (rivers, streams, marshes, wetlands, etc.), where it finds its prey . It feeds on a wide variety of reptiles , amphibians, small mammals, birds, large insects and rarely with mammals (Vlachos 1989, Zogaris et al. 2003).

Threats: The most serious threat to the species comes from the ongoing degradation and destruction of the freshwater wetlands, where it feeds, due to the intensification of agriculture (reforestation, clearing of hedgerows and lowland forests, etc.). Locally, it is threatened by human interventions in the nesting habitats, mainly from the operation of quarries, from the opening of roads, etc. and perhaps from poaching and pesticides.

Existing conservation measures: Protected species, the majority of its breeding population in Greece is found in areas of the SPA/Natura 2000 network.

Conservation measures required : Specific management plans and effective protection of the areas where the species reproduces, but mainly of its feeding habitats, are required. It also needs systematic monitoring of its populations.

***Circaetus gallicus* - Serpent eagle**

Red Book : International – LC , National – N T

The viper is migratory and comes to Greece in the Spring, when there is an abundance of reptiles, to breed, and leaves in the fall to hibernate in warmer countries. It is a predator with a wingspan that can reach up to 190 cm and is the only species of circling eagle found in Greece. It breeds in open dry areas with sparse forests, nests in trees and forages in open areas among maquis, scrub and scattered trees. It feeds almost exclusively on reptiles, snakes and lizards. It has large, yellow eyes, short claws to capture reptiles with ease, and its feet are covered with scales to protect against viper venom. The kestrel spends most of its time flying, usually over hills at low altitude, searching for its prey . Impressively, it can stay hovering in the same position monitoring its prey for several minutes. A basic condition for the reproduction of the viper is the abundance of reptiles, mainly snakes, but also the existence of areas with scrubland , pines and mixed forests, where it builds its nest, in combination with open areas, fields, which are suitable for hunting . The breeding season begins in mid-April and lays 1 egg which the female spins for about 50 days. The male supplies food to the female

and later to the chick until it is one month old. The chick can swallow a whole snake after three weeks and in 70-75 days it is ready to leave the nest.

Threats: The intensification of cultivation and the decrease in the availability of snakes have reduced the population of this species in some areas. Because it is almost entirely dependent on snakes, any action that destroys suitable habitats for snakes, or kills snakes directly, affects the viper's viability.

Aquatic bird species

Habitat loss and degradation appear to be the most important threats to this group of birds. Loss or degradation refers to both the feeding grounds of species such as the black stork (*Ciconia nigra*), and the nesting grounds of colonially nesting species such as herons, where the reduction of lakeside or riparian forests is a very serious threat. For herons in particular, most feeding grounds seem to be replaced by rice paddies. Rice fields are indeed an important feeding ground for these species, but here too the uncontrolled use of pesticides causes additional problems in finding food. One of the main causes of waterfowl habitat degradation is water pollution, which appears to be a threat to at least 14 species in this category. Species that live exclusively in freshwater wetlands, where pollution from pesticide residues is more intense, appear to be more vulnerable. Such species are the purple heron (*Ardea purpurea*), the gray heron (*Ardea cinerea*) and the night raven (*Nycticorax nycticorax*). An additional threat, mainly to ground-nesting aquatic species (avocets, terns, terns), is predators that damage colonies by eating eggs or chicks. The competition for nesting sites faced by herons, coots and pipits *(Platalea leucorodia*) from cormorants (*Phalacrocorax carbo)* is considered to be another problem: The population of cormorants has been increasing rapidly in recent years, resulting in the occupation of those of the limited nesting sites in the few available riparian forests. Natural disasters, such as drought, which can lead to the drying up of small wetlands that are feeding grounds for several species, appear to threaten species most associated with freshwater habitats.

Below is illustrated the area of the project under study in relation to Protected and Important Bird Areas (IBA) and National Parks.

Figure 1-7 National Parks in the Regional Unit of Evros, in relation to the area of interest

Figure 1-8 Important Bird Areas (IBAs) in the wider area of the Rhodope and Evros Regional Units, in relation to the area of interest

1.1.6. Bird Species Description - Standard Data Form (SDF) – S.A.

According to the official bulletins of the Natura 2000 area and the database of the Ministry of Natural Resources and Environment (DB_ENG_Nov2012_Access2003.mdb), the bird species data referred to in Article 4 of Directive 2009/147/EU and Annex II of Directive 92/43/EU are listed detailed in the table below.

Table 1-5. Bird species in Area GR1110008 according to the SDF of the NATURA 2000 area

ITEMS		population					Area assessment		
CODE	SCIENTIFIC NAME	TYPE	SIZE		Units	Cat.	A|B|C		
			min.	max.			KEEP	ISOLATION	TOTAL EVALUATION
A402	*Accipiter brevipes*	r	20	30	i		B	C	B
A223	*Aegolius funereus*	p	2	4	i		B	B	B
A 247	*Alauda arvensis*	w / r				C /P	B	C	B
A229	*Alcedo atthis*	r				P	B	C	B
A052	*Anas crecca*	w				P	B	C	B
A053	*Anas platyrhynchos*	p				P	B	C	B
A394	*Anser albifrons albifrons*	w				R	B	C	B
A255	*Anthus campestris*	r				P	B	C	B
A226	*Apus apus*	r				C	C	C	B
A028	*Ardea cinerea*	r	80	100	i		B	C	B
A215	*Bubo bubo*	p	2	4	i	P	A	C	B
A087	*Buteo buteo*	r	10	10	p		A	C	B

ITEMS		population					Area assessment		
CODE	SCIENTIFIC NAME	TYPE	SIZE		Units	Cat.	A|B|C		
			min.	max.			KEEP	ISOLATION	TOTAL EVALUATION
A243	*Calandrella brachydactyla*	r				P	B	C	B
A149	*Calidris alpina*	c				P	B	C	B
A145	*Calidris minuta*	c				R	B	C	B
A861	*Calidris pugnax*	c				P	B	C	B
A146	*Calidris temminckii*	c				P		C	C
A224	*Caprimulgus europaeus*	r	2	2	p		A	C	B
A137	*Charadrius hiaticula*	c				P	B	B	B
A080	*Circaetus gallicus*	r	3	5	p		A	C	B
A082	*Circus cyaneus*	w	8	8	i		A	C	B
A083	*Circus macrourus*	c				P	B	B	B
A 859	*Clanga clanga*	w				P	B	C	B
A113	*C oturnix coturnix*	r				C	A	C	B
A122	*Crex crex*	c				P	B	C	B
A212	*Cuculus canorus*	r				C	B	C	B
A480	*Cyanecula svecica*	c				P	B	C	C
A036	*Cygnus olor*	w				R	B	C	B
A738	*Delichon urbicum (urbica)*	r				C	A	C	B
A429	*Dendrocopos syriacus*	p				C	A	B	B
A026	*Egretta garzetta*	r / c	30	60	i	- / P	B	C	B

ITEMS		population					Area assessment		
CODE	SCIENTIFIC NAME	TYPE	SIZE		Units	Cat.	A|B|C		
			min.	max.			KEEP	ISOLATION	TOTAL EVALUATION
A447	*Emberiza caesia*	r				P	B	C	C
A379	*Emberiza hortulana*	w				P	B	C	B
A098	*Falco columbarius*	w				P	A	C	B
A100	*Falco eleonorae*	c				v	B	C	C
A 103	*Falco peregrinus*	c				P	B	C	C
A097	*Falco vespertitus*	c				P	B	C	B
A321	*Ficedula albicollis*	c				P	C	C	B
A320	*Ficedula parva*	c				P	B	C	B
A442	*Ficedula semitorquata*	c				P	B	B	B
A125	*Fulica atra*	w				P	B	C	B
A153	*Gallinago gallinago*	w				C	B	C	B
A131	*Himantopus himantopus*	r				V	B	C	C
A439	*Hippolais olivetorum*	r / c				P	B	C	B
A251	*Hirundo rustica*	r				C	A	C	B
A022	*Ixobrychus minutus*	r				C	B	C	B
A2 33	*Jynx torquilla*	r / c				R	B	C	B
A338	*Lanius collurio*	r / c				P/R	B	C	B
A339	*Lanius minor*	r				P	B	C	B
A433	*Lanius nubicus*	r				P	B	B	B

ITEMS		population					Area assessment		
CODE	SCIENTIFIC NAME	TYPE	SIZE		Units	Cat.	A|B|C		
			min.	max.			KEEP	ISOLATION	TOTAL EVALUATION
A182	*Larus canus*	w				V	B	B	B
A179	*Larus ridibundus*	w				P	B	C	B
A868	*Leiopicus medius*	p				P	B	C	B
A246	*Lullula arborea*	p				P	B	C	B
A855	*Mareca penelope*	w				P	B	C	B
A230	*Merops apiaste*	r				C	B	C	C
A875	*Microcarbo pygmaeus*	w				P	B	B	B
A074	*Milvus milvus*	c				V	C	B	B
A260	*Motacilla flava*	r / c				P/C	A	C	B
A023	*Nycticorax nycticorax*	r	130	150	i		B	C	B
A337	*Oriolus oriolus*	r / c				C	A	C	B
A355	*Passer hispaniolensis*	p				C	A	C	B
A072	*Pernis apivorus*	p / r				P	B	C	C/B
A391	*Phalacrocorax carbo sinensis*	w				P	B	C	B
A119	*Porzana porzana*	c				P	B	C	B
A249	*Riparia riparia*	c				R	B	C	B
A857	*Spatula clypeata*	w				P	B	C	B
A210	*Streptopelia turtur*	r / c				C	B	C	B
A307	*Sylvia nisoria*	r				P	B	B	B

ITEMS		population					Area assessment		
			SIZE				A|B|C		
CODE	SCIENTIFIC NAME	TYPE	min.	max.	Units	Cat.	KEEP	ISOLATION	TOTAL EVALUATION
A228	*Tachymarptis melba*	r / c				P	B	C	C/B
A166	*Tringa glareola*	c				P	B	C	B
A165	*Tringa ochropus*	w				P	B	C	B
A162	*Tringa totanus*	w				P	B	C	B
A892	*Zapornia parva*	c				P	B	B	B
A893	*Zapornia pusilla*	c				P	C	B	B

Table 1-6. Bird species in Area BG0002106 according to the SDF of the NATURA 2000 area

ITEMS		population					Area assessment		
			SIZE				A|B|C		
CODE	SCIENTIFIC NAME	TYPE	min.	max.	Units	Cat.	KEEP	ISOLATION	TOTAL EVALUATION
A086	*Accipiter nisus*	c	15	15	i		A	C	C
A086	*Accipiter nisus*	p	6	6	p		A	C	C
A086	*Accipiter nisus*	w	10	10	i		A	C	C
A229	*Alcedo atthis*	p	12	12	p		B	C	C
A054	*Anas acuta*	w		7	i		A	C	C
A052	*Anas crecca*	w	13	60	i		B	C	C
A050	*Anas penelope*	w		7	i		B	C	B

ITEMS		population					Area assessment		
CODE	SCIENTIFIC NAME	TYPE	SIZE		Units	Cat.	A|B|C		
			min.	max.			KEEP	ISOLATION	TOTAL EVALUATION
A053	*Anas platyrhynchos*	w	74	1026	i		B	C	B
A055	*Anas querquedula*	c	5	5	i		B	C	C
A051	*Anas strepera*	w	1	12	i		B	C	C
A041	*Anser albifrons*	w		351	i		A	C	B
A043	*Anser anser*	w		4	i		A	C	B
A255	*Anthus campestris*	r	2	2	p		B	C	C
A091	*Aquila chrysaetos*	p	1	1	p		A	C	A
A404	*Aquila heliaca*	p		1	p		B	C	C
A089	*Aquila pomarina*	r	5	5	p		A	C	C
A089	*Aquila pomarina*	c	10	10	i		A	C	C
A028	*Ardea cinerea*	c	25	25	i		B	C	C
A028	*Ardea cinerea*	r	5	5	p		B	C	C
A028	*Ardea cinerea*	w		2	i		A	C	C
A024	*Ardeola ralloides*	c	10	10	i		B	C	C
A059	*Aythya ferina*	w		62	i		A	C	C
A061	*Aythya fuligula*	w	2	15	i		A	C	C
A215	*Bubo bubo*	p	3	3	p		A	C	C
A067	*Bucephala clangula*	w	1	2	i		A	C	C

ITEMS		population					Area assessment		
CODE	SCIENTIFIC NAME	TYPE	SIZE		Units	Cat.	A|B|C		
			min.	max.			KEEP	ISOLATION	TOTAL EVALUATION
A133	*Burhinus oedicnemus*	r	2	2	p		B	C	B
A133	*Burhinus oedicnemus*	c	15	15	i		B	C	B
A087	*Buteo buteo*	p	7	7	p		A	C	C
A403	*Buteo rufinus*	p	3	3	p		B	C	C
A224	*Caprimulgus europaeus*	r	60	60	p		B	C	C
A136	*Charadrius dubius*	r	12	12	p		A	C	C
A196	*Chlidonias hybridus*	c	10	10	i		B	C	C
A198	*Chlidonias leucopterus*	c	5	5	i		B	C	C
A197	*Chlidonias niger*	c	15	15	i		B	C	C
A031	*Ciconia ciconia*	r	3	3	p		B	C	C
A030	*Ciconia nigra*	r	4	4	p		A	C	B
A030	*Ciconia nigra*	c	25	25	i		A	C	B
A080	*Circaetus gallicus*	r	2	2	p		A	C	C
A080	*Circaetus gallicus*	c	10	10	i		A	C	C
A081	*Circus aeruginosus*	c	20	20	i		B	C	C
A082	*Circus cyaneus*	c	5	5	i		A	C	C
A083	*Circus macrourus*	c	5	5	i		B	C	C
A084	*Circus pygargus*	c	5	5	i		B	C	C
A231	*Coracias garrulus*	r	2	2	p		B	C	C

ITEMS		population					Area assessment		
CODE	SCIENTIFIC NAME	TYPE	SIZE		Units	Cat.	A|B|C		
			min.	max.			KEEP	ISOLATION	TOTAL EVALUATION
A122	*Crex crex*	r	2	2	p		B	C	C
A038	*Cygnus cygnus*	w		7	i		B	C	C
A036	*Cygnus olor*	w		8	i		A	C	B
A238	*Dendrocopos medius*	p	25	25	p		B	C	C
A429	*Dendrocopos syriacus*	p	40	40	p		B	C	C
A236	*Dryocopus martius*	p	2	2	p		B	C	C
A027	*Egretta alba*	w		6	i		B	C	B
A026	*Egretta garzetta*	c	20	20	i		B	C	C
A379	*Emberiza hortulana*	r	80	80	p		B	C	C
A511	*Falco cherrug*	r		1	i		A	B	A
A098	*Falco columbarius*	c	2	2	i		B	C	C
A098	*Falco columbarius*	w		2	i		A	C	C
A103	*Falco peregrinus*	r	1	1	p		A	C	C
A099	*Falco subbuteo*	c	15	15	i		A	C	B
A099	*Falco subbuteo*	r	3	3	p		A	C	B
A096	*Falco tinnunculus*	p	6	6	p				
A097	*Falco vespertinus*	c	5	5	i		B	C	C
A125	*Fulica atra*	w	49	539	i		A	C	C
A153	*Gallinago gallinago*	c	10	10	i		A	C	B

ITEMS		population					Area assessment		
CODE	SCIENTIFIC NAME	TYPE	SIZE		Units	Cat.	A|B|C		
			min.	max.			KEEP	ISOLATION	TOTAL EVALUATION
A153	*Gallinago gallinago*	w		1	i		A	C	B
A002	*Gavia arctica*	w		2	i		A	C	C
A075	*Haliaeetus albicilla*	p	1	1	p		B	C	A
A092	*Hieraaetus pennatus*	c	10	10	i		A	C	A
A092	*Hieraaetus pennatus*	r	3	3	p		A	C	A
A131	*Himantopus himantopus*	r	2	2	p		A	C	C
A439	*Hippolais olivetorum*	r	5	5	p		B	C	C
A338	*Lanius collurio*	r	150	150	p		A	C	B
A339	*Lanius minor*	r	1	1	p		A	C	B
A433	*Lanius nubicus*	r	1	1	p		A	C	A
A459	*Larus cachinnans*	c	5	5	i		B	C	C
A459	*Larus cachinnans*	w	4	10	i		A	C	C
A179	*Larus ridibundus*	w	1	3	i				
A179	*Larus ridibundus*	c	15	15	i				
A246	*Lullula arborea*	p	70	70	p		A	C	C
A068	*Mergus albellus*	w	1	17	i		A	C	B
A230	*Merops apiaster*	c				P			
A073	*Milvus migrans*	r	2	2	p		A	C	B
A073	*Milvus migrans*	c	10	10	i		A	C	B

ITEMS		population					Area assessment		
CODE	SCIENTIFIC NAME	TYPE	SIZE		Units	Cat.	A|B|C		
			min.	max.			KEEP	ISOLATION	TOTAL EVALUATION
A077	*Neophron percnopterus*	r	1	2	p		A	C	C
A023	*Nycticorax nycticorax*	c	15	15	i		A	C	B
A094	*Pandion haliaetus*	r	1	1	p		B	B	A
A072	*Pernis apivorus*	c	40	40	i		A	C	B
A072	*Pernis apivorus*	r	4	4	p		A	C	B
A017	*Phalacrocorax carbo*	c	50	50	i		C	C	C
A017	*Phalacrocorax carbo*	w		338	i		C	C	C
A393	*Phalacrocorax pygmeus*	w	3	35	i		A	C	C
A151	*Philomachus pugnax*	c	5	5	i		B	C	C
A234	*Picus canus*	p	3	3	p		A	C	C
A032	*Plegadis falcinellus*	c	7	7	i		A	C	C
A005	*Podiceps cristatus*	w		11	i		A	C	C
A008	*Podiceps nigricollis*	w		2	i		A	C	C
A249	*Riparia riparia*	c				P	A	C	C
A193	*Sterna hirundo*	c	5	5	i		B	C	C
A307	*Sylvia nisoria*	r	10	10	p		A	C	C
A004	*Tachybaptus ruficollis*	w		8	i		A	C	B
A165	*Tringa ochropus*	c	5	5	i		A	C	B
A165	*Tringa ochropus*	w	10	10	i		A	C	B

ITEMS		population					Area assessment		
CODE	SCIENTIFIC NAME	TYPE	SIZE		Units	Cat.	A|B|C		
			min.	max.			KEEP	ISOLATION	TOTAL EVALUATION
A162	*Tringa totanus*	c	2	2	i		B	C	C
A162	*Tringa totanus*	w		1	i		A	C	C
A142	*Vanellus vanellus*	c	15	15	i		B	C	C
A247	*Alauda arvensis*		90	90	p				
A218	*Athene noctua*		18	18	p				
A366	*Carduelis cannabina*		40	40	p				
A363	*Carduelis chloris*		60	60	p				
A113	*Coturnix coturnix*		10	10	p				
A377	*Emberiza cirlus*		100	100	p				
A382	*Emberiza melanocephala*		80	80	p				
A269	*Erithacus rubecula*		300	300	p				
A359	*Fringilla coelebs*		800	800	p				
A244	*Galerida cristata*		20	20	p				
A251	*Hirundo rustica*		140	140	p				
A233	*Jynx torquilla*		5	5	p				
A271	*Luscinia megarhynchos*		150	150	p				
A383	*Miliaria calandra*		120	120	p				
A280	*Monticola saxatilis*		2	2	p				
A281	*Monticola solitarius*		2	2	p				

ITEMS		population					Area assessment		
CODE	SCIENTIFIC NAME	TYPE	SIZE		Units	Cat.	A|B|C		
			min.	max.			KEEP	ISOLATION	TOTAL EVALUATION
A214	*Otus scops*		60	60	p				
A329	*Parus caeruleus*		70	70	p				
A443	*Parus lugubris*		30	30	p				
A235	*Picus viridis*		15	15	p				
A276	*Saxicola torquata*		3	3	p				
A210	*Streptopelia turtur*		60	60	p				
A311	*Sylvia atricapilla*		100	100	p				
A305	*Sylvia melanocephala*		3	3	p				
A283	*Turdus merula*		250	250	p				
A285	*Turdus philomelos*		100	100	p				
A284	*Turdus pilaris*		100	100	i				

Type : Permanent (p): the species is present at the site throughout the year (non-migratory species or plant, resident population of migratory species)
Class : common (C), rare (R), very rare (V), or present (P)
Population (size and density of the population of the species present in the area in relation to the populations present in the national territory): A: 100 % ≥ p > 15 %, B: 15 % ≥ p > 2 %, C: 2 % ≥ p > 0 %.
Degree of Preservation : A: excellent preservation, B: good preservation, C: moderate or limited preservation
Isolation : A: (almost) isolated population, B: population not isolated, but at the edges of the range, C: population not isolated within the wider range
Overall Rating : A: excellent value, B: good value, C: adequate value

1.1.7. Other information about S.A.

It is noted that within the study area SPA GR 1110008 there are other special nature protection areas, which completely or partially overlap with the corresponding areas of the Natura 2000 network. The following are indicative:

Important Bird Areas

As mentioned above, the study area is additionally **an Important Bird Area (IBA),** according to **Bird Life International .** Its basic elements were given above.

- GR 001 – Riparian Forest of Northern Evros and Ardas (18,904.76 ha)

Habitat – Biodiversity – Corine (1991) :

- A00010202: Evros Riparian Forest (2,973.19 ha , terrestrial -> 2,400.00 ha)

This list was the starting point to include the most important ecological areas in the Natura 2000 Network. The Evros mountains were found to be in a downward trend from the first recording.

Area A00010202 refers to riparian forests along the river and on small islands within the river. Various species of birds of prey have been recorded in the area. In the adjacent grain crops *Circus nests pygrarus* (Meadow cricket). The status trend of the site is rapidly deteriorating as threats and disturbances increase over time and are related to illegal and illegal logging, land claims for agriculture and intensive hunting. The area is not under priority status in terms of species protection.

The characteristic types of woody vegetation are: *Populus alba* (silver-white) and *Salix alba alba* .

The notable bird species recorded for this habitat are:

Accipiter brevipes - Saini
Acrocephalus arundinaceus - Gummy bear
Acrocephalus schoenobaenus - Vourlopotamida
Ardea cinerea - Cinderella
Ardea purpurea - Purple heron
Ardeola ralloides - Cryptochiknias
Ciconia ciconia - White stork
Ciconia nigra - Black stork
Circaetus gallicus - Serpent eagle
Circus pygargus - Meadow circus
Coracias garrulus - Copperhead
Cuculus canorus - Cuckoo

Dendrocopos syriacus - Balkan gummy bear

Egretta garzetta - Lefkotsiknias

Emberiza melanocephala - Grape grower

Haliaeetus albicilla - Sea eagle

Hieraaetus pennatus - Golden eagle

Himantopus himantopus – Kalamokanas

Lanius collurio collurio - Aetomachus

Lanius minor - Lanius minor

Merops apiaster - Bee-eater

Milvus migrans migrans - Chiftis

Motacilla flava feldegg - Motacilla flava feldegg

Nycticorax nycticorax - Night raven

Oriolus oriolus oriolus - Sycophagus

Pernis apivorus - Pernis apivorus

Phalacrocorax carbo sinensis - Cormorant

Phalacrocorax pygmeus - Langona

Platalea leucorodia

Remiz pendulinus pendulinus - Budgerigar

Tachybaptus ruficollis - Nanodiver

Tringa glareola

Archaeological sites

- **Name** : Mikri Doxipara-Zoni, Plutos Kyprinou

Site Category : Terrestrial Archaeological Site

Geographic area - Administrative Jurisdiction : AN. MACEDONIA & THRACE, EVROS, ORESTIADS, KYPRINOS, ZONIS

Type of protection from the Ministry of Culture : Proclamation

Competent Service : EFA Evros

Protection Status : YPPO/GDAPC/ARCH/A1/Φ43/21634/911, Gazette: 58/AAP/2011-04-06,

YPPO/GDAPC/ARCH/A1/Φ43/53573/2466, Official Gazette: 169/AAP/2011-06-27"

Description : Burial mound at the location of Ploutos, formerly known as Mal-tepe, which stood in the western part of the province of northern Evros, south of the river Ardas and between the villages

of Mikri Doxipara, Zoni and Helidona. The excavation revealed four cremation burials with numerous bronze, iron, glass and gold offerings, five chariots with their underweights and two horse burials. Several sites with remains of offerings, two hearth pits and two square brick structures used as offering grates or epitaph altars were also found. On and around the structures were ashes, animal bones and dozens of fragments of small clay vessels.

The closest distance of the underground interconnecting cable, which connects the Wind Farm to the substation, is 5.67 kilometers and resulted from a drablade in a mapping program (ArcGis).

Related Bulletins : Small Doxipara-Zone, Carp Wealth, Zone A, Small Doxipara-Zone, Carp Wealth, Zone B

- **Name** : Elafochori Evrou

Site Category : Terrestrial Archaeological Site

Geographic area - Administrative Jurisdiction : E. OF MACEDONIA & THRACE, EVRO, DIDYMOTEICHO, METAXADA, ELAFOHORI

Type of protection from the Ministry of Culture : Proclamation

Competent Service : EFA Evros

Protection Status : YA YPPE/A1/Φ19/17176/696, Gazette: 731/B/1979-08-30

Description : At the northern end of the village of Dafni near Elafochori, an underground stone tomb of the Macedonian type is preserved, which presents special morphological characteristics, like all the contemporary stone tombs of Thrace. It is dated to the end of the 4th-beginning of the 3rd century BC.

Scientific documentation :

- Date, type of site / monument : Mortuary Sites
- Burial mound
- Documentation: remains Monuments: Built Thracian tomb covered by a mound
- Location: Elafochori

The closest distance of the underground interconnecting cable, which connects the Wind Farm to the substation, is 3.66 kilometers and resulted from drablade in a mapping program (ArcGis).

- **Name** : Thracian tomb, Elafochori, Evros

Category of Space : Ancient Monument

Geographic area - Administrative Jurisdiction : AN. OF MACEDONIA & THRACE, EVRO, DIDYMOTEICHO, METAXADON, ELAFOHORI

Type of protection from the Ministry of Culture : Proclamation

Competent Service : EFA Evros

Protection Status : YA YPPE/A1/Φ19/17176/696, Gazette: 731/B/1979-08-30

Description : Near the village of Elafochori, a built Thracian tomb from the Hellenistic era is preserved, covered by a mound.

The closest distance of the underground interconnecting cable, which connects the Wind Farm to the substation, is 3.66 kilometers and resulted from a drablade in a mapping program (ArcGis).

- **Name** : Koukoulospito, Metaxades, Evros, owned by the Community

Space Category : Newest Monument

Geographic area - Administrative Jurisdiction : AN. MACEDONIA & THRACE, EVRO, DIDYMOTEICHO, METAXADON, METAXADON

Type of protection from the Ministry of Culture : Proclamation

Competent Service : YNMTE of Eastern Macedonia and Thrace, YPEKA

Protection Status : YA YMATH/3223, Official Gazette: 605/D/1997-07-16, YA YPPO/DILAP/C/4700 p.e./9785, Official Gazette: 228/B/1998-03-11

Description : This is a hooded house consisting of a ground floor and an upper floor. The ground floor plan consists of three independent spaces, with a different entrance for each. It is made of porolite, carefully and precisely carved and placed in isostructural layers. A characteristic of the construction is the total absence of binding material. Visible double lashings encircle the structure at various heights, while the visible cleat impresses with its craftsmanship. The building is unpainted inside. On the contrary, the internal walls are plastered with lime or plaster and painted. The roof protrudes with an unclad shingle and is covered with Byzantine-style tiles. The Presentation took place in 1997.

The closest distance of the underground interconnecting cable, which connects the Wind Farm to the substation, is 10.90 kilometers and resulted from drablade in a mapping program (ArcGis).

- **Name** : Old churches of Paliouri

Site Category : Terrestrial Archaeological Site

Geographic area - Administrative Jurisdiction : AN. MACEDONIA & THRACE, EVRO, DIDYMOTEICHO, METAXADON, PALIOURI

Type of protection from the Ministry of Culture : Proclamation

Competent Service : EFA Evros

Protection Status : YA YPPE/A1/Φ19/17176/696, Gazette: 731/B/1979-08-30

Scientific documentation :

- Dating: Prehistoric Era
- Type Mortuary Places, Burial Mound
- Documentation: Documentation: remains Monuments: mound Site location: Old churches

The closest distance of the underground interconnecting cable, which connects the Wind Farm to the substation, is 9.60 kilometers and resulted from a drablade in a mapping program (ArcGis).

- **Name** : Prehistoric mound, Old Churches of Paliouri, Evros

Category of Space : Ancient Monument

Geographic area - Administrative Jurisdiction : AN. MACEDONIA & THRACE, EVRO, DIDYMOTEICHO, METAXADON, PALIOURI

Type of protection from the Ministry of Culture : Proclamation

Competent Service : EFA Evros

Protection Status : YA YPPE/A1/Φ19/17176/696, Gazette: 731/B/1979-08-30

Description : At the site of Old Churches, 2 km east of Paliouri village, there is a prehistoric mound.

The closest distance of the underground interconnecting cable, which connects the Wind Farm to the substation, is 9.80 kilometers and resulted from a drablade in a mapping program (ArcGis).

- **Name** : Building, Vrissika, Evros, allegedly owned by X. Grozoudi

Space Category : Newest Monument

Geographic area - Administrative Jurisdiction : AN. MACEDONIA & THRACE, EVRO, DIDYMOTEICHO, METAXADON, VRYSIKON

Type of protection from the Ministry of Culture : Proclamation

Competent Service : YNMTE of Eastern Macedonia and Thrace

Protection Status : YA YPPO/DNSAK/39794/1049, Official Gazette: 836/B/2005-03-21

Description : This is a typical example of a rural house, a two-story, wide-fronted building made with a wooden frame and brickwork or stonework. The edges of the building are emphasized with wooden false parapets while a wooden strip separates the two floors. The main face is of wooden frame in rectangular canvas and filled with solid optical bricks. The other sides of the building have few openings and are made with a wooden frame and filled with stones and plenty of mortar. Documentation Report 2003.

Table 1: The archaeological sites within a radius of 10 km .

Name	SPACE CATEGORY	TYPE OF PROTECTION	COMPETENT SERVICE	PROTECTION REGIME	DISTANCE FROM CABLE (km)
Mikri Doxipara-Zoni, Ploutos Kyprinou Zoni A	Land Archaeological Site	Declaration	EFA Evros	" YPPO/GDAPC/ARCH/A1/Φ43/21634/911", "Government Gazette: 58/AAP/2011-04-06", "Ministry of Education/GDAPC/ARCH/A1/Φ43/53573/2466", "Government Gazette: 169/AAP/2011-06-27"	5.67
Mikri Doxipara-Zone, Plutos Kyprinou Zone B	Land Archaeological Site	Another protection	EFA Evros	" YPPO/GDAPC/ARCH/A1/Φ43/21634/911", "Government Gazette: 58/AAP/2011-04-06", "Ministry of Education/GDAPC/ARCH/A1/Φ43/53573/2466", "Government Gazette: 169/AAP/2011-06-27"	6.00
Elafochori of Evros	Land Archaeological Site	Declaration	EFA Evros	"YA YPPE/A1/Φ19/17176/696", "Government Gazette: 731/B/1979-08-30"	3.66
Thracian tomb, Elafochori, Evros	Ancient monument	Declaration	EFA Evros	"YA YPPE/A1/Φ19/17176/696", "Government Gazette: 731/B/1979-08-30"	10.90
Kukoulospito, Metaxades, Evros, owned by the Community	Newer Monument	Declaration	YNMTE of Eastern Macedonia and Thrace, Ministry of Finance	"YA YMATH/3223", "GAZETTE: 605/D/1997-07-16", "GA YPPO/DILAP/G/4700 p.e./9785", "GAZETTE: 228/B/1998-03-11 "	9.60
Old churches of Paliouri	Land Archaeological Site	Declaration	EFA Evros	"YA YPPE/A1/Φ19/17176/696", "Government Gazette: 731/B/1979-08-30"	9.80
Building, Vrysika, Evros, allegedly owned by Ch. Grozoudi	Newer Monument	Declaration	YNMTE of Eastern Macedonia and Thrace	"YA YPPO/DNSAK/39794/1049", "Government Gazette: 836/B/2005-03-21"	8.00

Illustrated below are the archaeological sites located within a radius of 10 km from the project area.

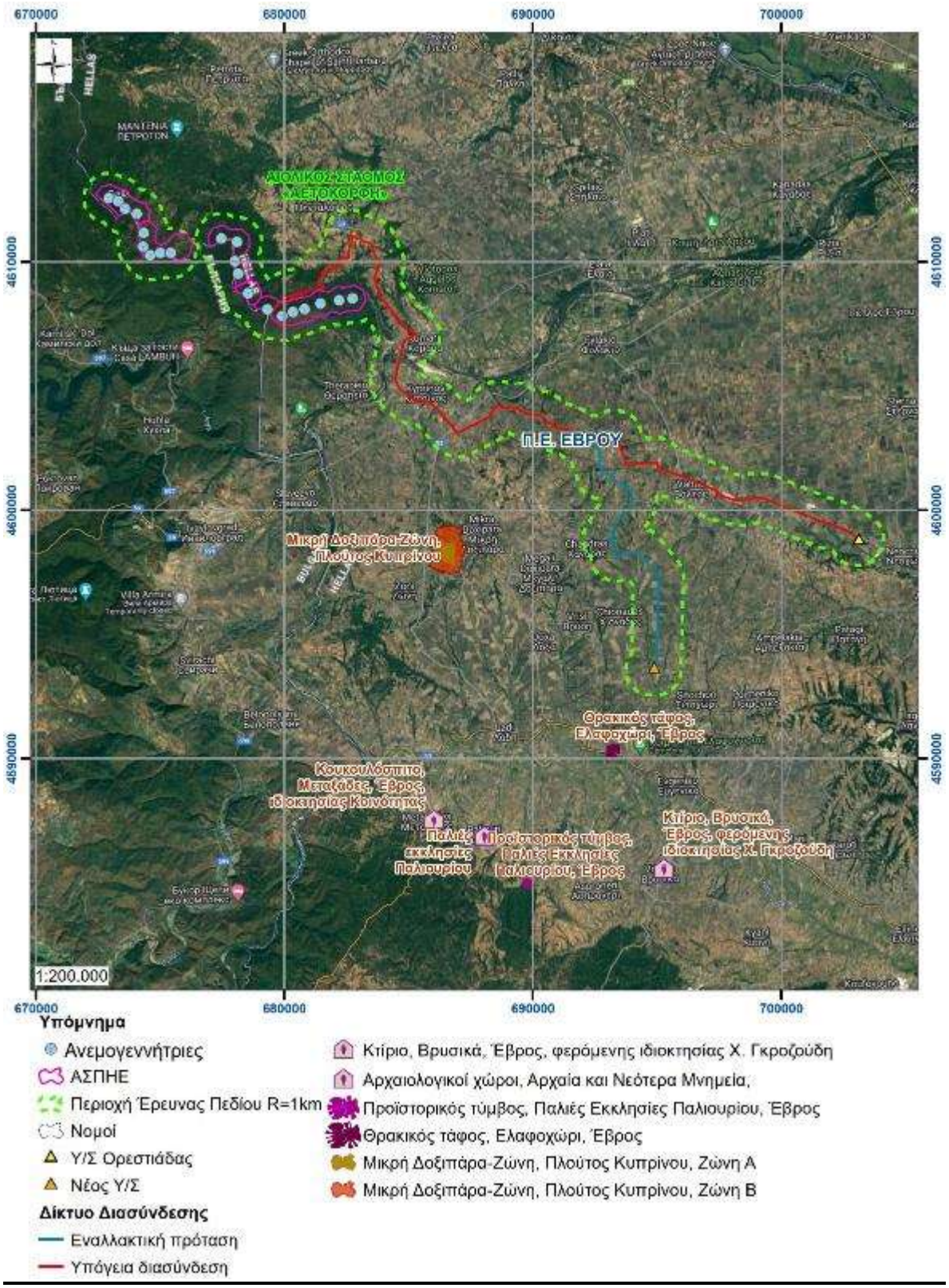

Figure 1-9 Land Archaeological sites, Ancient and Newer Monuments, in the Regional Unit of Evros, in relation to the area of interest

1.1.8. Other areas of special interest located in the wider area

NATURA 2000 areas in the Evros and Rhodope Regional Units:

SPA Area , GR 1110008 Riparian Forest of Northern Evros and Arda:

Interconnection cable distance from area : 0.00 km

Area: 25,161.96ha

Administrative affiliation: P.E. Evros

Area SCI , GR 1110007 Evros Delta:

Interconnection cable distance from area : 67.00 km

Area: 9,634.65 ha

Administrative affiliation: P.E. Evros

SPA area , GR 1110006 Evros Delta:

Interconnection cable distance from area : 70.00 km

Area: 12,372.82 ha

Administrative affiliation: P.E. Evros

SPA area GR 1130011 Filiouris Valley:

Interconnection cable distance from area : 7.50 km

Area: 37,370.36 ha

Administrative affiliation: P.E. Rhodope

Area SCI , GR 1110013 Sea area of Thrace:

Interconnection cable distance from area : 78.00 km

Area: 75,756.28 ha

Administrative affiliation: P.E. Evros

SPA area GR 111002 Dadias-Soufli Forest:

Interconnection cable distance from area : 25.20 km

Area: 42,338.55 ha

Administrative affiliation: P.E. Evros

SPA area GR 1110010 Mountainous Evros - Valley of Derios:

Interconnection cable distance from area : 22.00 km

Area: 48,907.49 ha

Administrative affiliation: P.E. Evros

SCI Area , GR 1110003 Three Taps:

Interconnection cable distance from area : 22.00 km

Area: 9,912.62 ha

Administrative affiliation: P.E. Evros

SCI Area , GR 1110005 Evros Mountains – Lyra River – Didymoteicho Caves:

Interconnection cable distance from area: 25.20 km

Area: 42,372.50 ha

Administrative affiliation: P.E. Evros

SPA area , GR 1110011 - Erythropotamos Valley: Asvestades, Koufovouno, Vrissika:

Interconnection cable distance from area : 40.60 km

Area: 9,408.82 ha

Administrative affiliation: P.E. Evros

Types of characterization (with criteria C) and types of demarcation (d):

Hippolais olivetorum - Bush warbler (crit. C 2)

Lanius nubicus – Pardalokefalas (cr. C 2)

Ciconia nigra - Black stork (cr. d)

Milvus migrans – Woodpecker (crit . d)

Aquila pomarina - Golden eagle (crit . d)

Hieraaetus pennatus – Hawk eagle (crit . d)

Merops apiaster – European bee-eater (cr. d)

Coracias garrulus – European copper crown (cr. d)

Lullula arborea - Tree wheat (cr. d)

Alauda arvensis – Common cornfield (cr. d)

Emberiza melanocephala – Vintner (critic d)

Wildlife Sanctuaries (WAS) at a distance of up to 50 km from the project under study

" *Within the wildlife sanctuaries, hunting, competition of hunting skills of pointer dogs, fishing, capture of wild fauna, collection of wild flora, destruction of natural vegetation zone in any way, destruction of plant hedges, sand mining, the drainage, the filling and drying of marshy areas, the pollution of water bodies, the disposal or disposal of waste, the development of fish farms, the carrying out of military exercises, as well as the inclusion of the area of the refuge in urban planning or urban planning. Installation of wildlife observatories is permitted."* (Law 3937/2011, Art. 5, par. 4.3.b))

Below are marked the closest to the project under study Wildlife Refuges, within the P.E. Evros:

- K1: Komaro Dam (703.87 ha), the locations of W/T 20 and W/T 21 are located within the boundaries of the KAZ area.
- K2: Good Gialos. (412.98 ha), 8.80 km east of the project under study.
- K3: Votsi (2,078.93 ha) 15.27 km south of the project.
- K4: Birds (2,085.58 ha) 25.30 km southwest of the project

Important Bird Areas (IBAs)

The project falls within the boundaries of the Important Bird Area with code GR 001. Information about the area is listed in the above chapter (chapter 1.1.4.).

At a distance of 7.5 km south of the project under study, the Important Bird Area is located with the code GR 002 and the name "Vrissika Limestone Area". The area is also considered a Special Protection Zone for the bird fauna, according to the NATURA 2000 documents. The basic information of the important area:

SBB code : **GR002**

Name of SPP : **Limestone area of Vrissika**

SPA code: GR1110011

Name Z OP : Erythropotamos Valley: Asvestades, Koufovouno, Vrissika

Minimum Altitude 20 m

Maximum Altitude 263 m

SPA area: 9,587.12 h a

Types of classification & assessment by the Greek Red Book:

Hippolais olivetorum – Bush warbler (E . K . B . : NT)

Lanius nubicus – Pardalokefalas (E . K . B . : NT)

Ciconia nigra – Black stork (E.K.B. : EN)

Milvus migrans – Tsiftis (E.K.B .: CR)

Aquila *pomarina*

Hieraaetus *pennatus* – Falcon / Osprey (E.K.B .: EN)

Merops apiaster – European bee eater

Coracias garrulus – European copper crown (E.K.B .: VU)

Lullula arborea - Tree wheat

Alauda arvensis – Common wheat field (E.K.B .: NT)

Emberiza melanocephala – Vintner

Below are shown the areas of environmental interest in R.U. Evros and a part of R.U. Rhodope.

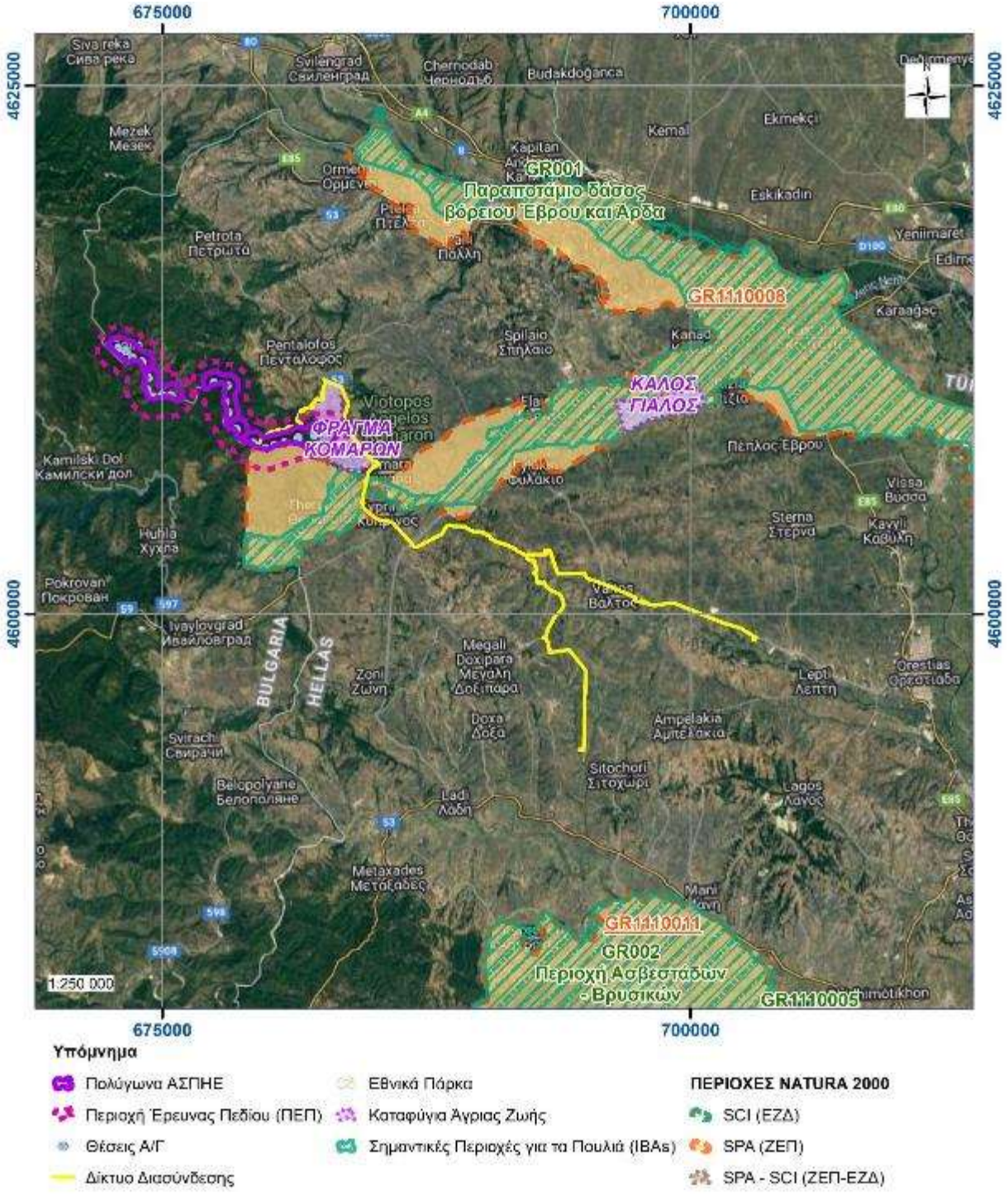

Figure 1-10. Areas of environmental interest - Protected Areas in R.U. Evros and R.U. Rhodope

2. RECORDING AND ANALYSIS OF THE ELEMENTS OF THE NATURAL ENVIRONMENT

2.1. WORKING - RECORDING METHODS

The field measurements carried out in the context of the present study lasted twenty-five (25) days, covering the entire annual activity of the bird species in the wider area of the project. In the wider area and especially in the lowland area of Pentalofos, Rizion and Spileo, the study team has prepared field records in the context of ESA studies of Wind Farms and PV projects which were also taken into account in the present study to complete the list of avifauna. The samplings took place at specific time intervals with a certain dispersion in order to better and more fully record and evaluate the bird fauna. More specifically, the dates included a total of 25 days of field measurements and were as follows:

8-9/7/2021	8/10/2021	15-17/3/2022
18-19/7/2021	17-18/11/2021	11/4/2022
8/27/2021	14/12/2021	3-5/5/2022
10/9/2021	20/1/2022	12-13/6/2022
23/9/2021	12/2/2022	20/6/2022
	23/2/2022	12/7/2022

For the analysis of the existing information, all existing published and unpublished sources related to the avifauna of the region were used. The existence of areas of special interest (SCI , SPA and wildlife sanctuaries) at a shorter or longer distance from the location of the projects provides important information about bird species. More specifically, the bibliographic data used for the area are as follows:

- The information sheet of the NATURA 2000 Network concerning the SPA area GR 1110008 "Riparian Forest of Northern Evros"
- The database of the area of the NATURA 2000 Network that concerns the area SPA GR 1110008 "Parapotamio Forest of Northern Evros"
- 3rd National Report - Implementation Report of Directive 92/43/EEC
- Wind Farms in Thrace, WWF Greece 's Revised Proper Siting Proposal
- Evaluation of the existing veterinary and health legislation and the practices of artificial feeding of carrion-eating birds of prey in Greece - Proposals for the best integration of the European Union Regulations and guidelines for the competent authorities.

According to the method of standardized ornithological investigation, quantitative records of all species found in the study area were carried out. More extensive measurements were made in

places of interest such as individuals and groups of bushes and trees, rocky outcrops which birds usually use for cover and nesting and places near streams, where intense activity by many birds and the existence of birds of special interest were observed (79/ 409).

The avifauna records are mainly focused on species included in Annex I of the CFA. E.P. 37338/1807/E.103, are included in the red book for the birds of Greece and are under protection status, but also among those that are considered more vulnerable due to the construction of wind farms in mountainous and semi-mountainous areas.

LINE TRANSECTS

These logs include the traversal of specific routes within the boundaries of the defined logging zone as described. These routes also include the crossings from the roads that lead to the recording points carried out by the other methods. The aim of the method is to "scan" the study area through the road network, or paths, and to record and identify bird species, their distribution and nesting sites. The method is mainly applied on foot, as in this way a gentler approach is made to places used by the birds and the observer can more easily record the species without disturbing them. During the movement of vehicles on the roads of the area, species observed on both sides of the route are recorded. Along the Line transects sampling is also done with point counts (Point Count Stations). For the area of the projects, the existing rural roads and specific paths in the wider area were selected. With this method, a very good recording and approximation of the species found in the area and an estimation of their population was made, mainly with regard to the ostrich species.

POINTS MEASUREMENTS (POINT COUNT STATIONS)

The method concerns the recording of birdlife from fixed points either visually or acoustically. It is used to record all species, but is most effective for strutiomorphs. The method records the individuals that fly from the perching positions when the observers approach, the individuals that fly in the wider area and also records the species according to the calls heard. In standardized documents, all species found are recorded. Point measurements are made at random points within the Wind Farm polygon and at a distance around it, within the study area. The point recording stations (PCS) are mainly selected on either side of the crossing lines.

RECORDS FROM VANTAGE POINTS

Recordings from surveillance points aim to quantify the activity of bird species (especially predatory and sensitive species) within the limits of the 2.0 km radius area around the projects with the main objective of verifying the existence or passage of specific species and of the possible risk from the construction and operation of the project. It includes the detailed mapping of all bird activity as well as the estimation of the time and height of the species' flights within the boundaries of the recording

zone. The method is mostly applied to predatory species. The recording of the species is done using a telescope and binoculars. The observation point is usually located at high altitude points from which it is easy to look down and observe with a fixed optical means (telescope). The surveillance point is defined and used in each field visit.

RECORDING ITEMS WITH PLAYBACK CALLS

The main purpose of applying the method is to identify cryptic species such as nocturnal predatory species, and to mark the presence of these species within the limits of the 2.0 km radius area around the Project Polygons.

RECORDING EQUIPMENT

In order to carry out the recordings during the field work as part of the preparation of this study, special equipment is used as follows:

- GPS with 1.0m accuracy
- Compass
- Binoculars
- Vanguard endeavor 82A telescope
- Swarovski telescope
- Call player
- S 4 Song device meter of Wild Acoustic for recording calls of bird species
- SM4 BAT FS device to record the frequencies of pelican species

During the field work, with the application of the methods described above, the observations were systematically recorded in standardized recording forms drawn up by the study team. The recording forms used in the field work are standardized and coded by method and species category in order to better organize the field work and also to document the records by competent agencies.

2.1.1. Work methods - Records

In total, as part of this Study, bird fauna were recorded from seven (7) Vantage Points and six (6) Point Count Stations.

The observation points have been taken in positions from where the possibility of observing the entire study area is provided. The waypoint method was mainly used to record predatory species and large birds that fly at high altitudes. Table 2-1 lists the monitoring points and recording point stations that were used for the recordings in the context of this study. The surveillance points used to record flights were chosen in a position with a panoramic view and at a distance from the location of the works so as not to cause significant disturbance and change in the behavior of the species.

Table 2-1 . Positions of Supervisory recording points for the project under consideration

a/a	Point code	Recording method	Habitat	Coordinates	
				X	Y
1	VP1	Next point	Oak Forest	673218.30	4612456.58
2	VP2	Next point	Oak Forest	673916.80	4611987.21
3	VP3	Next point	Oak Forest	674328.23	4611123.87
4	VP 4	Next point	Oak Forest	677986.60	4609969.07
5	VP 5	Next point	Oak Forest	680680.28	4607966.66
6	VP 6	Next point	Agricultural crops	684302.44	4607754.99
7	VP7	Next point	Oak Forest	675988.15	4610831.04
8	PCS 1	Point station recording	Oak Forest	673662.46	4612093,11
9	PCS2	Point station recording	Oak Forest	675496.03	4610327.01
10	PCS 3	Point station recording	Oak Forest	678025.71	4610934.62
1 1	PCS 4	Point station recording	Oak Forest	679517.97	4607981.87
1 2	PCS 5	Point station recording	Agricultural crops	684551.84	4607611.84
1 3	PCS 6	Point station recording	Oak Forest	682296.10	4608410.49

Table 2-2. LTK for the project under consideration

a/a	Route Code	Interim method	Habitat	Route Length (m)
1	LTK1	CAR / PEDESTRIAN	Oak Forest	6282.4
2	LTK2	CAR / PEDESTRIAN	Oak Forest	5614.6
3	LTK3	CAR / PEDESTRIAN	Oak Forest	2464.75
4	LTK4	CAR / PEDESTRIAN	Oak Forest	5204.2
5	LTK11	CAR / PEDESTRIAN	Agricultural crops – Shrubs – Settlements – Riparian sites	20664.01

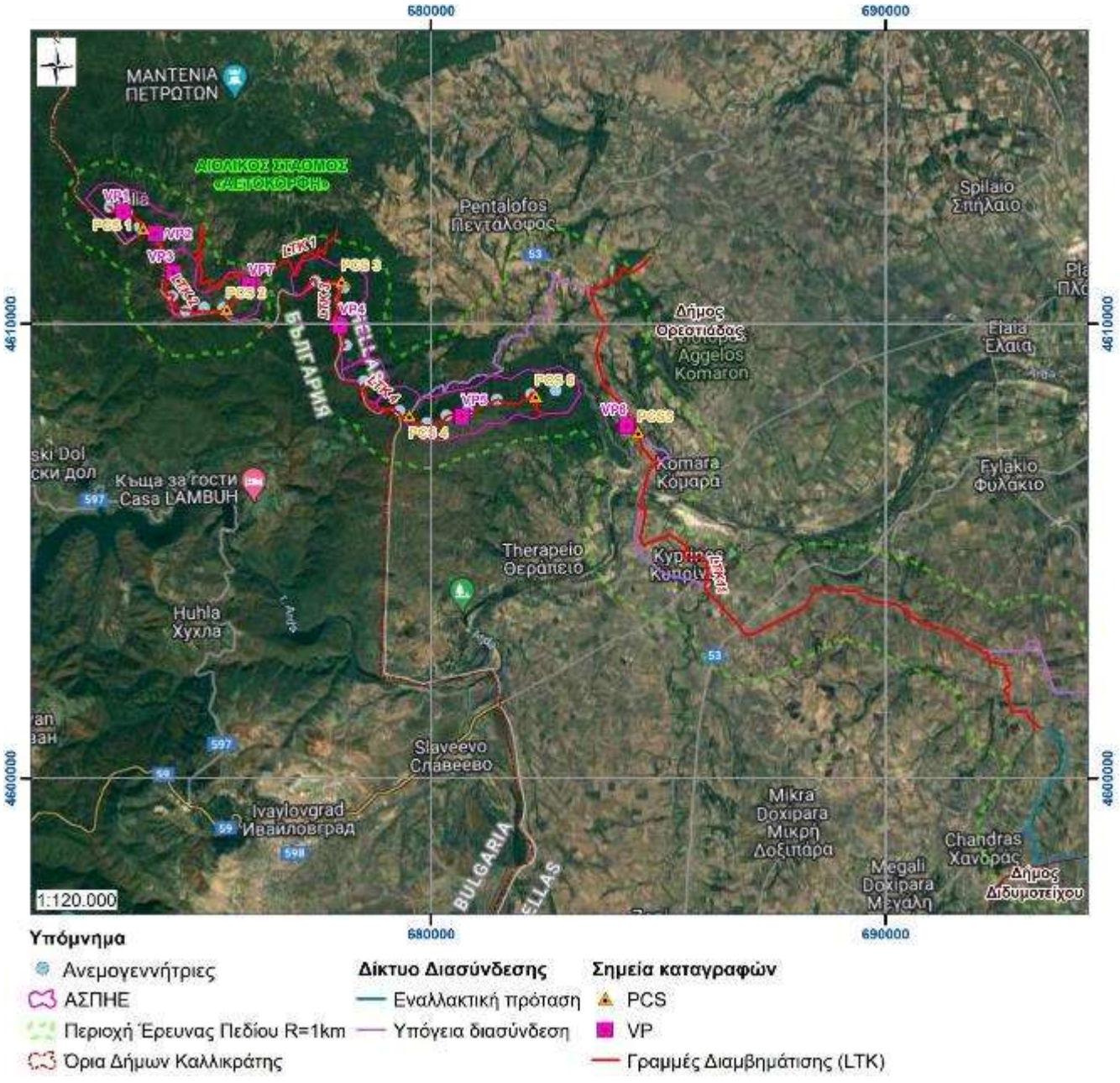

Figure 2-1. The recording points in the FRA of the project under study

2.1.2. Description of Habitat Types - Data Analysis in the Field Research Area (FRA)

According to photo interpretation in the FRA, the habitats recorded are the following:

91M0 (formerly 924A, which was completely replaced by 91M0): Pannonian oak forests with Quercus cerris and/or Quercus petraea . In the FRA and especially in the places of establishment of the WT. These are oak forests usually of pure form and in a mixture with other broad-leaved species. The form of the forests is deciduous and in places has significant gaps and strong signs of logging. It appears in a mix with deciduous species of shrubs and other broad-leaved species, the species found are the following: *Quercus cerris , Q. petraea* , *Q. Frainetto , Q. conferta , Juniperus oxucedrus , Carpinus orientalis , Ostrya carpinifolia , Fraxinus ornus, Acer Campestre* (good conservation prospects). Oak forests are usually single-stemmed and double-stemmed oak, and some managed stands are semi-stemmed. They are usually dense with relatively poor pore space. In cases of degradation due to overgrazing or fire, the vegetation may be sparser and lower and the herbaceous understory richer. Habitat type 91M0 is subject to mainly anthropogenic pressures, such as deforestation, grazing, change of use and non-management of occupied surfaces. Fires are also a factor in the degradation of this particular ecosystem.

934A : Greek Forests of Prinos . Degraded oak forests, thickets dominated by holly, juniper and sedge. This type resulted from the degradation of habitat 91M0 (formerly 924A "Thermophilous oak forests", with *Quercus pubescens , Carpinus orientalis , Carpinus betulus , Ostrya carpinifolia*), in scrubland, due to the aforementioned pressures, which still exist today.

3280 Mediterranean rivers with a permanent flow of Paspalo – Agrostidion and dense canopy vegetation of Salix and Populus alba along their banks. It occurs along the permanently floblade bed of the Ardas River. It is dominated by nitrophilous annual and perennial grasses and burl formations on the alluvial banks of the river. Habitat type 3280 is characterized by plant communities on banks or islands, with sandy or sandy loam soil, located in or near the bed. A few from the characteristics items of type habitat is the : *Agrostis stolonifera, Alisma plantago – aquatica, Amaranthus albus, Amaranthus retroflexus, Artemisia vulgaris, Atriplex prostate, Bidens* species , *Bidens tripartitus, Centaurium tenuiflorum, Dysphania pumilio, Cyperus fuscus, Digitaria sanguinalis, Echinochloa crus –galli, Eleocharis palustris, Equisetum arvense, Eragostis minor, Eragostis Pilosa, Paspalum distichum, Rorippa sylvestris, Veronica anagallis* – aquatica etc.

92A0 Forests – galleries with Salix alba and Populus Alba . Includes the riparian forests - arcades, dominated by willow and poplar species. The characteristic presence of many species of climbing plants creates a structurally complex ecological environment. Layering the tree floor in two heights is common. The upper one is dominated by poplar species and the lower one by willow

species. Shrub and herbaceous understoreys show a wide range in cover, depending on light conditions within stands. The most common species are: *Salix alba , S. fragilis , S. eleagnos , S. purpurea , Populus alba , Fraxinus* spp *., Alnus glutinosa , Clematis vitalba , Vitis vinifera , Cynanchum acutum , Periploca graeca , Hedera helix , Smilax aspera , Humulus lupulus , Solanum dulcamara , Urtica dioca , Agrostis stolonifera* .

92 C 0 Platanus forests orientalis and/or Liquidambar orientalis . includes forests that colonize the slightly stabilized river deposits, colluvium, gravel pits, springs. Some of the characteristic species of the habitat type are: *Agrostis* sp . *, Alnus glutinosa , Arum italicum , Brachypodium sylvaticum , Carex pendula , Celtis australis , Clematis vitalba , Equisetum arvense , E. ramosissinum , E. telmateia , Geranium robertanium , Hedera helix , Juglans regia , Melissa officinalis , Mycelis muralis, Nerium oleander , Platanus orientalis , Pteridium aquilinum , Rubus sanctus , Symphytum bulbosum, Vitex agnus – castus* etc..

1020 *:* Agricultural crops . The field survey area includes a few scattered plots. Due to the chronic interventions in the surface horizons of the soil in the cultivated lands, the productive load of these soils has been degraded and by extension the load of organic carbon. Main area of extensive agricultural crops is located in the south and lowlands of Avantas.

1050 : Bare barrens. Mostly in the project area the surfaces of forest roads, bare surfaces without vegetation and the trenches of the old and disused quarry. Also included in this code are the lands of the settlements.

Table 2-3. Types of Habitats in the Area of the FRA of the Wind Farm under study

NAME	HABITAT CODE	AREA (Ha)	RATE (%)
Pannonian oak forests with Quercus cerris and/or Quercus petraea.	91M0	2,792.49	98.40%
Greek Forests of Prinos	934A	1.65	0.06%
Agricultural crops	1020	43 , 66	1.54%
	total	**2,837.80**	**100.00%**

Below are the types of habitats in the FRA of the interconnection cable of Wind Farm with the new Substation and the Substation of Orestiada.

Table 2-4. Types of Habitats in the Area of the FRA of the connection cable of the wind farm under study

NAME	HABITAT CODE	AREA (Ha)	RATE (%)
Bare Barrens – Quarry Trench	1050	134 , 63	1.47
Greek Forests of Prinos	934A	148.93	1.63
Platanus orientalis and / or Liquidambar orientalis forests	92C0	75 , 5 4	0.82
Agricultural crops	1020	7261 ,18	79.24
Pannonian oak forests with Quercus cerris and/or Quercus petraea.	91M0	1401 , 6 9	15.30
Mediterranean rivers with a permanent flow of Paspalo – Agrostidion and dense curtain vegetation of Salix and Populus alba along their banks.	3280	56 , 79	0.62
Forests – galleries with Salix alba and Populus alba	92A0	84 , 71	0.92
	total	**9,163.47**	**100.00%**

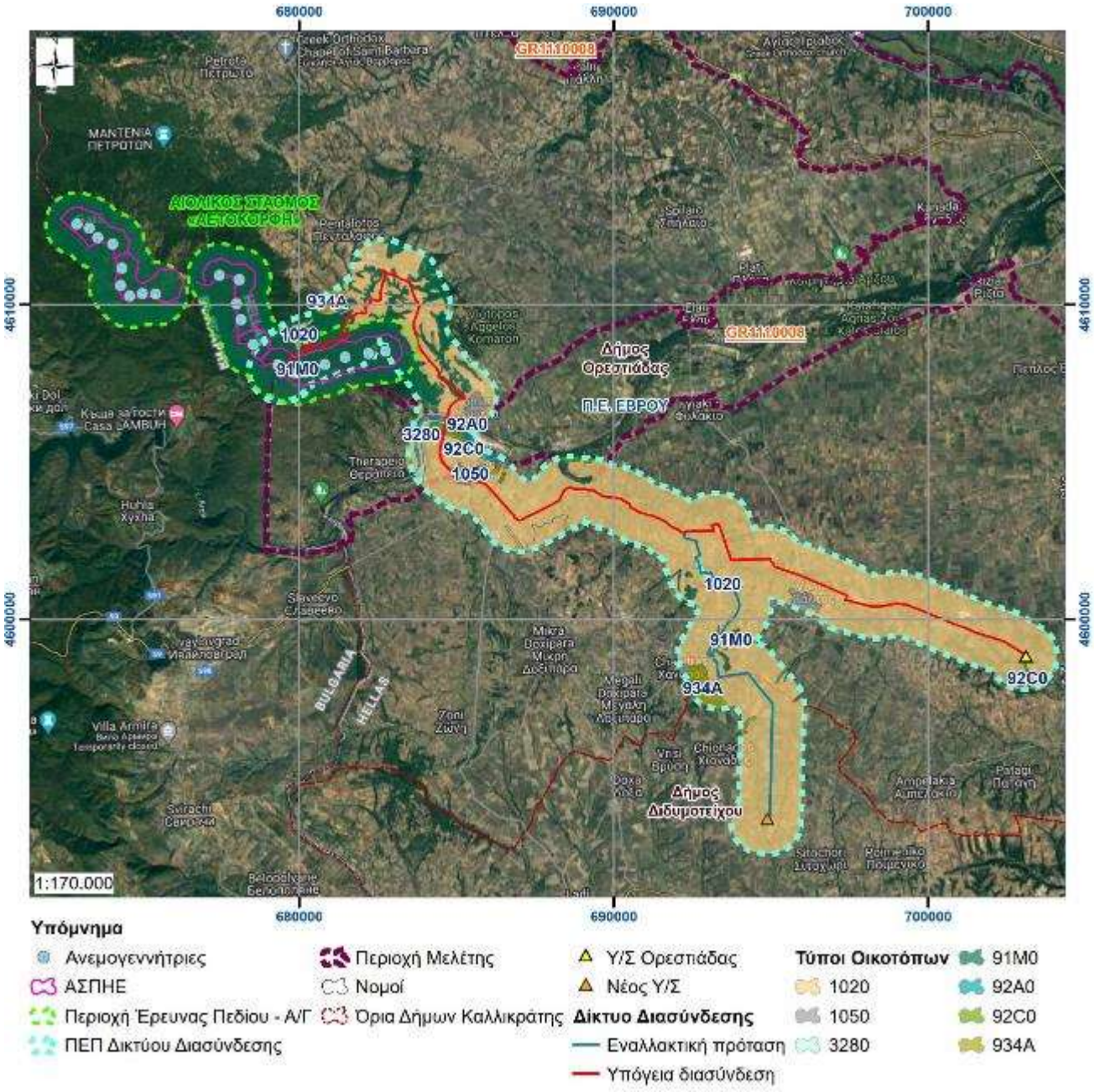

Figure 2-2. Spatial distribution of habitat types in the area of the FRA of the Wind Farm (using google earth map)

2.1.3. Description of Flora Species - Data analysis in FRA

The area of the Wind Farm under study at the location "Aetokorfi" is mainly a forest with a characteristic habitat in 91M0. The locations through which the interconnection cable passes are mainly agricultural crops and scrubland, with typical habitats 1020 and 934A, respectively. The forest is dominated by woody vegetation with the presence of grassy areas. In the scrublands, sclerophyllous shrubby vegetation dominates. Agricultural crops are dominated by grasses and leguminous herbaceous plants. The area of the interconnection cable installation also passes through habitats of wetland systems, such as 3280, and riparian forests, such as 92C0 and 92A0, which are respectively located within and around the Ardas River bed.

The wider area of Trigono belongs for the most part to the habitat with code 1020, which is not included in Annex I of Directive 92/43/EEC.

Table 2-5 includes the flora species with the most frequent occurrence, based on the literature, in the wider area in and around the field research area.

Table 2-5 . Species of flora occurring within the FRA

	SHRUBS - TREES			PLANT VEGETATION	
N/A	FLORA SPECIES	COMMON NAME	N/A	FLORA SPECIES	COMMON NAME
1	*Quercus coccifera*	Yew	40	*Spartium junceum*	Sparta
2	*Paliurus spina cristi*	Paliouri	41	*Dactylis glomerata*	Ring or solid
3	*Carpinus orientalis*	Gavros	42	*Brachypodium pinnatum*	Short footed
4	*Quercus frainetto*	Broadleaf oak	43	*Onopordum illyricum*	Thistle
5	*Pyrus amygdaliformis*	Gorcia	44	*Carex tomentosa*	-
6	*Quercus petraea*	Oak the stone	45	*Stachys angustifolia*	-
7	*Clematis vitalba*	Leufkampelos	46	*Chrysanthemum coronarium*	
8	*Rosa sempervirens*	Pomegranate the evergreen	47	*Briza media*	
9	*Quercus pubescens*	Mossy oak	48	*Colutea arborescens*	Bubble
10	*Fraxinus ornus*	Fraxos	4 9	*Festuca oviniformis*	*Festuca oviniformis*
11	*Rosa canina*	Wild rose	50	*Onosma heterophyllum*	Name
12	*Rhus coriaria*	Rush	51	*Trifolium medium*	Trefoil
13	*Sorbus domestica*	Sorbia or domestic	52	*Thymus sp.*	
14	*Sorbus torminalis*	Sorbia the antidysenteric	53	*Ruscus aculeatus*	Hare apple
15	*Rosa arvensis*	Wild rose	54	*Dianthus corymbosus*	Dianthus
16	*Erica arborea*	Reiki the arboreal	55	*Ornithogalum narbonense*	

	SHRUBS - TREES			PLANT VEGETATION	
N/A	FLORA SPECIES	COMMON NAME	N/A	FLORA SPECIES	COMMON NAME
17	*Crataegus monogyna*	Hawthorn	56	*Centaurea melitensis*	
18	*Cistus creticus ssp.*	Ladania	57	*Poa palustris*	
19	*Pyrus pyraster*	Wild pear	58	*Brachypodium pinnatum*	Short footed
20	*Acer sp.*	Maple tree	59	*Eryngium campestre*	Nutmeg
2 1	*Rubus sp.*	Bramble	60	*Ranunculus millefoliatus*	buttercup
2 2	*Prunus spinosa*	Chapournia	6 1	*Papaver rhoas*	Poppy
23	*Phillirea media*	Fillyra	6 2	*Bromis inermis*	
24	*Clematis flammula*	Clematis the fiery	6 3	*Cotoneaster integerrimus*	Kydoniastro
25	*Juniperus oxycedrus*	Juniper the oxyhedron	6 4	*Gladiolus italicus*	
26	*Rosa pendulina* L.	Wild rose	6 5	*Muscari comosum*	
2 7	*Rubus canescens*	Bramble	6 6	*Digitalis ferruginea*	Ring
28	*Salix alba*	Willow tree	67	*Alisma plantago – aquatica*	
29	*Populus alba*	Whites	68	*Amaranthus albus*	
30	*Vitis vinifera*	Vineyard	69	*Artemisia vulgaris*	
31	*Solanum dulcamara*	Dulkamara	70	*Digitaria sanguinalis*	
32	*Smilax aspera*	Arkudovatos	71	*Paspalum distichum*	
33	*S alix eleagnos*	Willow or oleaginous	72	*Rorippa sylvestris*	
34	*Ostrya carpinifolia*	Meliogauros	73	*Equisetum arvense*	
35	*Juglans regia*	Walnuts	74	*Eleocharis palustris*	
36	*Platanus orientalis*	plane tree	75	*Plantago lanceolata*	
37	*Rubus sanctus*	Vatos the holy	76	*Ranunculus trichophyllus*	
38	*Celtis australis*	Honeysuckle	77	*Melissa officinalis*	
39	*Cercis siliquastrum*	Koutsoupia	78	*Centaurium tenuiflorum*	
			79	*Verbascum glabratum*	Verbasco
			80	*Phleum montanum*	Dam
			81	*Malva parviflora*	
			82	*Bromus racemosus*	Oatmeal
			83	*Lolium perenn e*	Lol
			84	*Dactylis glomerata*	Ring
			85	*Agrostis stolonifera*	
			86	*Periploca graeca*	

	SHRUBS - TREES			PLANT VEGETATION	
N/A	FLORA SPECIES	COMMON NAME	N/A	FLORA SPECIES	COMMON NAME
			87	*Alopecurus utriculatus*	
			88	*Potamogeton nodosus*	
			89	*Lepidium coronopus*	
			90	*Ludwigia palustris*	
			91	*Fontinalis antipyretica*	
			92	*Vitex agnus – castus*	
			93	*Hedera helix*	
			94	*Sinapis arvenis*	
			95	*Brachypodium sylvaticum*	Short-legged forest
			96	*Eryngium campestre*	Nutmeg
			97	*Poa bulbosa*	Whoa
			98	*Festuca ovina*	Fescue
			99	*Poa bulbosa*	-
			100	*Agrostis capillaris*	-
			101	*Poa angustifolia*	-
			102	*Scandix pecten-veneris*	
			103	*Luzula forsteri*	-
			104	*Silene armeria*	-
			105	*Verbascum macrurum*	Verbasco the wet tail

The vegetation of the area of the mountain formations, where the wind turbines are located, consists of oak forests. It is noted that no species of flora included in Appendix II of JMD E.P.44105/1398/E103/1.8.2013 was recorded.

2.1.4. Description of Fauna Species - Data analysis in FRA

Based on the literature, below are listed the species of fauna, whose appearance in the habitats of interest, in terms of the project under study, is more frequent.

A. Species of fauna

mamals

The species of mammals that appear in the area and have been noticed by local breeders mainly, but also in sampling, by their presence or by the traces they leave behind, such as footprints or feces, are the following species:

Table 2-6 . Records of mammalian species of fauna in the FRA.

a/a	Species	ANNEX II 2006/105	RED BOOK	HABITAT
1	*Erinaceus concolor (East European hedgehog)*	-	NE	Agricultural crops, bushes
2	*Lepus europaeus (Hare)*	-	NE	Agricultural crops, bushes
3	*Apodemus agrarius*	-	NE	Agricultural crops, bushes
4	*Vulpes vulpes (Fox)*	-	NE	Agricultural crops, scrub, Oak forests
5	*Martes foina (Petrokunavos)*	-	NE	Agricultural crops, scrub, Oak forests
6	*Mustela nivalis (Weasel)*	-	NE	Agricultural crops, bushes
7	*Meles meles (Badger)*	-	NE	Agricultural crops, scrub, Oak forests
8	*Sus scrofa (Boar)*	-	NE	Agricultural crops, scrub, Oak forests
9	*Canis lupus (Wolf)*			Agricultural crops, bushes, Forests, industrial lands

Red Book Evaluation : NE= Not evaluated

In addition to the records of species made by visual observation, the estimation of the presence of mammal species can be done by the method of identification of biological material. Thus, for the FRA, the presence of the following species of mammals is assessed by finding corresponding biological material (feces, corpses, etc.) or by identifying the activity sites of the specific species (ground disturbance, holes, roosting sites, etc.)

Table 2-7 . Records of biological material of mammalian species in the FRA.

a/a	Species	Category of biological material	ANNEX II 2006/105	RED BOOK	HABITAT
1	*Vulpes vulpes (Fox)*	stool	-	NO	Forest, crops, roads
2	*Sus scrofa (Boar)*	Ground disturbance	-	NO	Forest, crops

Red Book Assessment : NE= Not Assessed VU = Endangered LC= Of Reduced Interest

In detail for the mammal species with the most frequent appearance in the SA and the FRA, we mention the following:

***Vulpes vulpes* (Fox)**

Ecology: breeds from January to February, maturity occurs at the age of 9 months. Adaptable species found in a wide variety of habitats (forests, wastelands and cultivated lands). It feeds 80% on species of animal origin (rats, mice, moles, squirrels, hares, insects, snakes, ground birds, rodents) and 20% on species of plant origin (juicy fruits, apples, blueberries, figs, etc. etc.). A nocturnal species, it nests in underground galleries on the ground which branch into 3-4 smaller ones and all the branches have an exit to the ground. Its economic importance in agriculture is great because of its contribution to the control of rodent growth.

Threats - dangers: scabies, rabies, poisoned baits.

Population assessment: in the wider area of the project there are active nests of the species. It nests on the edges of bush and forest areas with agricultural crops at a distance from the presence of man. The species is not included in appendix II of the E.P. 44105/1398/E.103/ 1-8-2013 and belongs to the non-assessed in the Greek Red Book. The presence of the species is usually ascertained by finding biological material.

***Meles meles* (Badger)**

Ecology: reproduces from July to August, matures at the age of 2 years. It is mainly found in forests and scrublands near agricultural lands. An omnivore, plant foods make up 75% of its diet. Nocturnal species. It nests in underground galleries which have several corridors and many exits. During the winter it hibernates. Its role in agriculture is considered beneficial for agriculture.

Threats - dangers: diseases - pests

Population estimate: occurs sporadically in the project area foraging. There are no nests of this species in the subsoil of the area where the project under consideration will be installed.

***Mustela nivalis (* Weasel)**

Ecology : breeds in March, matures sexually in 6 (females) to 12 months (males). It prefers cultivated lands as a habitat. It nests in tree trunks, in piles of stones, under bushes or in holes in abandoned buildings. Nocturnal species. It feeds on mice, moles, squirrels, lizards, snakes, amphibians and birds. It rarely eats the flesh, mainly sucking the blood of the prey.

Threats - dangers: its main threat is the fox, the hawks and the owl

Population estimate: in the wider area it appears often as it approaches the neighboring agricultural lands and also the chicken coops in settlements. There are no indications of nests in the project area.

***Lepus europaeus* (Hare)**

Ecology: reproduces from February to the end of August, sexually matures in 7-8 months. It prefers lowland areas with crops, scrublands, and sparse forests as a habitat. Nests on the ground under bushes, uses two or more nests. Nocturnal species. A type of herbivore.

Threats - dangers: his enemies are the fox, the hawks, the owl, the eagles, the weasel. It is a valuable game, many individuals are hunted every year.

Population estimate: in the wider area it appears frequently as it approaches the neighboring agricultural lands. Based on estimates it prefers the higher places where there are more bushy areas.

***Erinaceus europaeus* (Hedgehog)**

Ecology: breeds from February to March, gives birth in early summer. It prefers lowland areas with crops, scrublands, and sparse forests as a habitat. It nests on the ground and under bushes. Nocturnal species. Omnivorous species.

Threats - dangers: his enemies are the fox. Significant losses occur along road axes

Population estimate: in the wider area it occurs frequently.

Threats – risks: The main threats to hedgehogs in forest ecosystems come both directly from human activity involving forest crossings and from activities in adjacent areas that provide refuge for the species.

***Sus scrofa* (wild boar)**

The species is not protected by any national or community legislation and is a prey species. In recent years its population has increased to a large extent and its appearance has been observed in lowland agricultural lands and in settlements. The emergence of African swine fever with outbreaks in neighboring Bulgaria is likely to affect the local population. In the wider area, many biological traces are found, mainly feces and soil disturbance in the oak forests and bushes.

Rodentia species are numerous in the project area. An important factor for the significant population is the strong human presence and the nearby settlements and agricultural lands. Common and frequent is the presence in the studied habitats of the rodent species: ***Rattus norvegicus (*** **A rat** ***),*** ***Apodemus agararius*** **(Agroponticus),** ***Apodemus flavicolis*** **(Kricoponticus)**

In addition, the grazing material of the wet meadows near the Ardas river can be directly grazed mainly by large farm animals (cows and horses), but also by wild herbivores. The interaction of grazing and the presence of endangered bird species in the same wetland habitat has positive effects on biodiversity conservation.

Chiroptera

In order to record the types of cheiropters, a frequency recording receiver was placed in positions in the FRA and with the use of special software for identifying the recorded frequencies in the office, the following types were recorded:

Table 2-8. Bat species recorded in the FRA

a/a	Species	APPENDIX II 2006/105 and IV of Directive 92/43/EEC	RED BOOK	HABITAT
1	*Rhinolophus* ferrumequinum	X	LC	A species of karst regions, on the borders of high mountains, in open forests and scrublands, often near rivers or other surface water.
2	*Myotis blythii*	X	LC	In forests, scrub, meadows, wetlands, caves, crops, pastures, plantations and urban areas.
3	*Myotis myotis*	X	**NT**	In forests, scrub, meadows, wetlands, caves, crops, pastures, plantations and urban areas.
4	*Myotis emarginatus* (Pyrromyotid)	X	**NT**	In shrubs and woody vegetation.
5	*Eptesicus serotinus* (Holy bat)		LC	In riparian areas, cultivated land, meadows, forest edges and settlements.
6	*Myotis mystacinus* (Mustachio bat)		DD	In riparian forests, grasslands and scrub.
7	*Nyctalus leisleri* (Little Nightcrawler)		LC	In forests with a warm climate.
8	*Pipistrellus pipistrellus (Pipistrellus pipistrellus)*		DD	In open areas with isolated trees, woodland and scrubland and coastal habitats.
9	*Pipistrellus pygmaeus* (Little bat)		DD	In mixed forests and near water
10	*Plecotus austriacus* (Gray-eared bat)		DD	In rural landscapes, rural areas and river valleys
1 1	*Myotis emarginatus* (Pyrromyotid)	X	**NT**	In shrubs and woody vegetation

Rhinolophus *(Rhinolophus ferrumequinum)* :

Protection status: Protected by the Forestry Code and the PD. 67/1981 "On the protection of native flora and fauna and defining a procedure for coordination and control of research on them". It is included in Annexes II and IV of Council Directive 92/43/EEC of 21.5.1992 for the conservation of natural habitats as well as wild fauna and flora (with subsequent amendments). It is also included in Annex II of the Berne Convention in Annex II of the Bonn Convention. Finally it has been mentioned by many Sites of Community Importance (Natura 2000 areas).

Ecology : The rhinolophus, like the other species of the rhinolophus family, owes its name to a membranous process on its nostrils that resembles a horseshoe. In the ear it does not have the characteristic process of other bat species (goat), but a fold of skin. It rests hanging upside down, wrapping its entire body with the membrane of the blades. The dense, soft coat of the body is usually light brown. The membrane of the blades and the large ears are light gray-brown. It is the largest species of the rhinolophus family and one of the largest bats in Greece. The body length is 5.6 - 7.1 cm and the tail 3.3 - 4.3 cm. The wingspan of the rhinolophus is 29 - 35 centimeters and its weight is 14 - 34 grams. It is usually found in open forests and scrubland, often near rivers or other surface water. It is active after sunset and hunts insects and mainly beetles throughout the night. It often uses temporary shelters at night, near the hunting area, to rest between its feeding forays. It usually does not move more than 8 km from the day shelter to feed. However, longer movements have also been recorded, up to 64 km. It usually hibernates in caves during the winter, but if the weather is mild it may come out and feed. In addition to caves, it can also use building roofs as a shelter, especially during the summer. In summer, pregnant females form colonies consisting of 50 - 500 or more females and young, while adult males live in small isolated groups. Each female gives birth to a single young, usually after the third year of life. The longest recorded lifespan for this species is 30 years which is the maximum of any European bat species.

It is an endangered species, as are almost all bat species. In many areas, its populations have been greatly reduced or eliminated. The main cause is the change in agricultural practices leading to a decrease in food availability and the intensive use of chemicals for plant protection. The tourist exploitation of caves reduces the available shelters for the species, as a result it takes refuge on the roofs of buildings, where it is hunted or dies due to the chemicals used to protect the wood.

Myotis *blythii* :

Protection status: Protected by the Forestry Code and the PD. 67/1981 "On the protection of native flora and fauna and defining a procedure for coordination and control of research on them". It is included in Annexes II and IV of Council Directive 92/43/EEC of 21.5.1992 for the conservation of

natural habitats as well as wild fauna and flora (with subsequent amendments). It is also included in Annex II of the Berne Convention in Annex II of the Bonn Convention.

Ecology : It is a strictly cave-dwelling species and creates large colonies (a few dozen to a few thousand individuals) in caves and mines. It probably moves seasonally between different roosts in the summer to breed and in the winter as its numbers fluctuate. In some regions of Europe it has also been found in the attics of buildings. In relation to other chiroptera, it is the most common prey of the peploglauca (*Tyto alba*) in Greece. It preys on grassland and bushy areas, including farmland and gardens, as well as forest clearings.

Myotis myotis (*Myotis myotis*):

Protection status: Protected by the Forestry Code and the PD. 67/1981 "On the protection of native flora and fauna and defining a procedure for coordination and control of research on them". It is included in Annexes II and IV of Council Directive 92/43/EEC of 21.5.1992 for the conservation of natural habitats as well as wild fauna and flora (with subsequent amendments). It is also included in Annex II of the Berne Convention in Annex II of the Bonn Convention. It has also been listed as a Site of Community Importance (Natura 2000 areas).

Ecology : In Greece it finds refuge in caves and other underground habitats, probably all year round. In N. Europe in summer it forms colonies in attics and occasionally in trees. Its feeding habits in our country are unknown, but in other countries it hunts in forests, above the trees, in scrublands and in pastures. Together with Myotida, they often appear, forming mixed colonies. Distinguishing these species in situ is often difficult, due to the similar morphological characteristics of the two species. Most habitats are at altitudes between 100 m and 800 m. On a year-round basis they reside in underground shelters – karst, volcanic and sea caves and mine shafts. Individuals in abandoned military forts (Pyramid Fort).

Myotis *(Myotis emarginatus)*:

Protection status: Included in Annexes II and IV of Council Directive 92/43/EEC of 21.5.1992 for the conservation of natural habitats as well as wild fauna and flora (with subsequent amendments). It is also included in Annex II of the Berne Convention in Annex II of the Bonn Convention. It has also been listed as a Site of Community Importance (Natura 2000 areas).

Ecology: It lives in the karst areas, in the national parks, in areas without caves. The species is also found in the basements of abandoned buildings, churches and houses, old military forts and other shelters. Prefers areas with shrubs and woody vegetation. Most of its shelters are in the mountains with an altitude of 400 m to 500 m (Benda et al 2003).

Its hunting habits are not known in Greece, but in other areas it hunts its food in forests (deciduous and coniferous) and less in grasslands, scrublands and crops. In summer, it takes refuge in caves, mines and other underground passages and occasionally in buildings, while it winters mostly in caves and mines. Its refuges are not generally known in Greece, however it is a species that moves seasonally between summer refuges and wintering grounds. In some caves and mines of Thrace, for example, they are observed only in spring and summer.

Bat *(Eptesicus serotinus)* :

Protection status: Protected by the Forestry Code. It is included in Annexes IV of the Habitats Directive 92/43/EEC and Annex II of the Bern Convention and Annex II of the Bonn Convention. It has also been mentioned by several Sites of Community Importance (Natura 2000 areas).

Ecology: Its habitats and its ecology are largely unknown in Greece. In other areas of its distribution, it hunts for its food in scrublands, pastures, forests and semi-urban areas. Summer colonies use buildings and occasional trees and small hollows or crevices in rocks. It hibernates singly or in small groups of individuals, in small hollows or crevices of rocks and sometimes in caves.

Widespread up to 1600 m. It is considered that this species is stationary, but migrations over distances of several tens of kilometers have also been noticed. It prefers open areas with groups of trees as well as rocky soils. It is often found in settlements. It is mainly found in the mountainous parts of the research polygons – in the Western Rhodopes in the area of the village of Ribnovo and in the open pits of the Falakros mountain at an altitude of 1900 m.

Mustache bat *(Myotis mystacinus)* :

Protection status: Protected by the Forestry Code and the PD. 67/1981 "On the protection of native flora and fauna and defining a procedure for coordination and control of research on them". It is included in Annex IV of Council Directive 92/43/EEC of 21.5.1992 on the conservation of natural habitats and wild fauna and flora (with subsequent amendments). It is also included in Annex II of the Berne Convention in Annex II of the Bonn Convention. It has also been listed as a Site of Community Importance (Natura 2000 areas).

Ecology : In other areas of its distribution it hunts in wooded and steppe lands and scrublands, near water reservoirs. In summer it creates colonies on old trees and buildings. It hibernates in small groups in caves and mines. The foraging habitat is riparian forests, grasslands and bushes. They often appear within villages and settlements in gardens and pits. In the summer they nest in houses behind shutters, paneling, cracks and gaps. Less often in tree trunks and rock crevices. In winter they nest in colonies in cavernous mine galleries and rock cellars. Breeding colonies consist of 20-60 individuals to several hundred. In the Balkans the colonies are small 2-10 females mixed with

males. Colony positions often change every 10-14 days. Food is taken during very skillful flight with many maneuvers and at the edges of forests and thickets. The flight height varies from 1 to 6 meters from the ground and in forested areas. They often fly for hours over lakes and bodies of water in circular flights of large diameter and duration. They feed on insects and mainly on mosquitoes, gnats, hymenoptera, and lepidoptera. Locally they are found hunting arthropods such as spiders and caterpillars.

Nyctalus *(Nyctalus leisleri)* :

Protection status: Protected by the Forestry Code and the PD. 67/1981 "On the protection of native flora and fauna and defining a procedure for coordination and control of research on them". It is included in Annex IV of Council Directive 92/43/EEC of 21.5.1992 on the conservation of natural habitats and wild fauna and flora (with subsequent amendments). It is also included in Annex II of the Berne Convention in Annex II of the Bonn Convention. It has also been listed as a Site of Community Importance (Natura 2000 areas).

Ecology : It shows a wide distribution in Europe. The habitat of the species is mainly coniferous forests. It nests in hollows and holes in trees and holes made by woodpeckers. Breeding colonies are composed of 20-50 females. Males form small colonies of up to 12 individuals. Hunts insects in forests, pastures and river valleys. It is highly dependent on mature forests with old trees. They coexist with other forest-dwelling bat species. It mates in late July to September. Performs fast and straight flight just above or below tree canopy, occurs on forest roads and water surfaces. It feeds on insects. It migrates in the direction North – South.

Nanobat *(Pipistrellus pipistrellus)* :

Protection status: Protected by the Forestry Code and the PD. 67/1981 "On the protection of native flora and fauna and defining a procedure for coordination and control of research on them". It is included in Annex IV of Council Directive 92/43/EEC of 21.5.1992 on the conservation of natural habitats and wild fauna and flora (with subsequent amendments). It is also included in Annex II of the Berne Convention in Annex II of the Bonn Convention. It has also been listed as a Site of Community Importance (Natura 2000 areas).

Ecology : Common perches are tree trunks in various semi-enclosed places and in crevices of buildings. It is also considered to be a synanthropic species. It preys on many different ecosystems including woodlands, especially clearings and forest edges, farmland, wetlands and urban areas. In summer it takes refuge mainly in buildings and trees, and females usually change places during the pregnancy period. In autumn they congregate in caves in high altitude areas, where they look for their mate. In winter they hibernate mainly in buildings but also in rock crevices and trees. The

species has been recorded with high hunting activity from sea level to high mountain parts, in coastal habitats, along coastal inhabited areas and in river valleys.

Microbat (Pipistrellus pygmaeus) :

Protection status: Protected by the Forestry Code. It is included in Annex IV of Council Directive 92/43/EEC of 21.5.1992 on the conservation of natural habitats and wild fauna and flora (with subsequent amendments). It is also included in Annex II of the Berne Convention. It has also been listed as a Site of Community Importance (Natura 2000 areas).

Ecology : Common bat from the high parts of the mountains or mountains to the sea areas. It lives in broad-leaved, deciduous and mixed forests, it is often found in settlements, gardens, parks, near water - lakes, large rivers. It hunts for food over wooded areas and wetlands, and is more dependent on water areas than *P. pipistrellus* . Breeding colonies generally use buildings as well as trees. No specific data are available on the type of wintering sites it prefers, but they are probably similar to those used by *P. pipistrellus* .

Gray eared bat *(Plecotus austriacus)* :

Protection status: Protected by the Forestry Code and the PD. 67/1981 "On the protection of native flora and fauna and defining a procedure for coordination and control of research on them". It is included in Annex IV of Council Directive 92/43/EEC of 21.5.1992 on the conservation of natural habitats and wild fauna and flora (with subsequent amendments). It is also included in Annex II of the Berne Convention in Annex II of the Bonn Convention.

Ecology : It is generally found in the lower parts of the whole country. In the mountains - up to 1,400 m . It prefers low and open landscapes with a steppe character, rural areas, river valleys and inhabited areas (Benda et al 2003). Hunts insects over open ecosystems and forests. At least in central and northern Europe in summer it usually congregates in buildings (attices, cracks, cavities), although solitary animals can roost in caves and mines. It hibernates in buildings, mines, and caves. In Greece it is not known where he finds refuge.

Reptiles

The reptile species most commonly observed in the FRA are given in Table 2-9.

Table 2-9 . Reptile species in the area of interest.

a/a	Species	APPENDIX II 2006/105	RED BOOK	HABITAT
1	*Lacerta viridis (Green Lizard)*	-	LC	Bare, rocky slopes
2	*Testudo hermanni (Mediterranean turtle)*	v	VU	Forest, Bare, Crops, bushes
3	*Podarcis muralis (Mural lizard)*	v	LC	Forest, bare, rocky slopes
4	*Elaphe quatuorlineata (Lafiatis)*	v	LC	Agricultural crops, Forest, Bare, rocky slopes
5	*Dolichophis caspius*	-	LC	Agricultural crops, Forest, Bare, rocky slopes
6	*Vipera ammodytes (Viper)*	-	LC	Agricultural crops, Forest, Bare, rocky slopes
7	*Malpolon insignitus (Sapitis)*	-	LC	Agricultural crops, Forest, Bare, rocky slopes

Red Book Rating : LC= Reduced Interest NT = Near Threatened, VU = Vulnerable

Lacerta viridis (Green lizard): We estimate that there is a significant population of the species in good conservation status.

Testudo hermanni (Mediterranean turtle): The specific species is included in APPENDIX II E.P. 44105/1398/E.103. It is estimated that the population is satisfactory with a wide distribution in the area and does not suffer from particular pressures and threats.

Podarcis muralis (Tichosaurus): Occurrence mainly on southern slopes and near rocks and stony areas within the forest. It is estimated that the population is satisfactory with a wide distribution in the area and does not suffer from particular pressures and threats.

Elaphe quatuorlineata (Lafiatis) **:** Adapts to a variety of habitats at altitudes up to 1400m. A diurnal snake that avoids very high temperatures. Hunts on the ground, but often climbs trees and bushes. He swims skillfully. It feeds on small mammals such as rats and other rodents, small rabbits, birds, lizards, amphibians and eggs. It mates in the spring and the females lay 3-18 eggs and the hatchlings are up to 40cm long.

Dolichophis caspius (Efios) : It responds from sea level up to altitudes of 1600m. A fairly common snake, fast and nervous, actively chasing its prey. It often climbs high into bushes and trees to hunt. It feeds on rodents and lizards, but also on other snakes and birds. It mates in the spring and females

lay 5-18 eggs. Juveniles feed on insects and small lizards. It will defend itself vigorously if threatened by raising the front of the body high.

Vipera ammodytes (Viper) : It is active during the day but also at night when the temperatures are high. Its habitats vary, but it seems to prefer sunny, dry and rocky slopes with little vegetation. It often climbs bushes and stone walls. It mates in late spring and females give birth to 4-20 pups, late August. It hibernates in October and wakes up in February-March. It feeds mainly on small mammals but also small birds, amphibians and lizards.

Malpolon insignitus (Sapitis) : Diurnal, very common snake. It moves quickly, swims and climbs with ease and is distinguished by its good vision. Its habitats vary but it seems to prefer dry areas with Mediterranean maquis. Usually in areas with an altitude of 0-600m, but it can also be found at higher altitudes.

2.1.5. Description of Poultry Species - Data analysis in FRA

In the wider area of the project under study, after 24 days of fieldwork throughout the year and the utilization of field recordings for neighboring RES projects, a total of 82 species of birds were recorded (17.37% of the total number of species of the Greek avifauna 472) where they belong to 25 families. The most numerous family is the *Accipitridae* with thirteen (13) species, *Turtidae* with nine (9) species, the *Sylvidae* with six (6) species, the *Alaudidae* (Larks) and, followed by the *Falconidae* (Hirakomorpha), the *Corvidae* , Paridae *,* Picidae *,* Motacillidae *and* Fringillidae *with* four (4) species each, followed by *Strigidae* and *Laniidae* (Cephalades) with three (3) species, then the Ciconiidae (Storks), *Columbidae* (Peristerids), *Strigidae* (Glaucus), *Meropidae* (Bee-eaters), *Hirundidae* (Swallows), *Muscicapidae* (Flycatchers), and *Emberizidae* (Cichlonia) with two species per family followed by the following families with one (1) species: *Phalacrocoracidae* , *Cuculidae* , *Caprimulgidae* , *Apopidae* , *Upupidae* , *Troglodytidae* and *Sturnidae* (Fishfish).

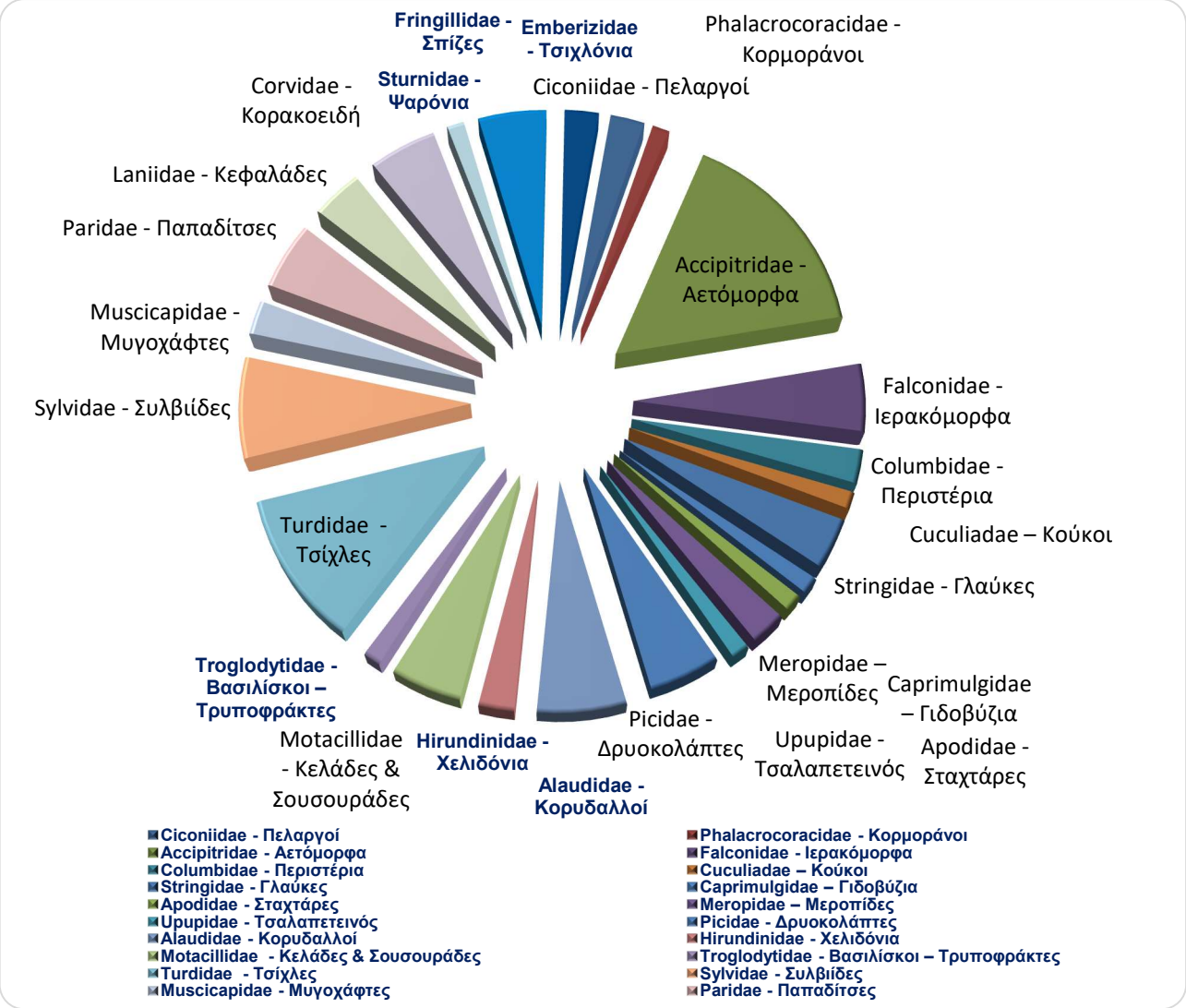

Figure 2-1 : Bird species occurring in the project area, by family

- **30** species **(36.59%)** are included in **Annex I** of the **EPA E.P. 37338/1807/ E103,**
- **23** species **(28.04%)** are included in the **Red Book of the birds of Greece,**
- **5 species (6%) are listed as Endangered (EN)**
- **4** species **(4.88%)** included in Near Threatened (**NT**) – 4 species (4.88%) in Reptiles **(VU)** **-** 1 species (1.22%) in Critically Endangered (**CR**) - 9 species (10.98%) in Least Concern (LC) and
- **58 species (70.73%)** are not included in the Greek Red Book of birds **.**

The total species recorded from the 24-day fieldwork are as follows:

The set of most frequently recorded species and according to ornithological research methods, are the following:

1. *Ciconia nigra* (Black Stork)

Protection regime: Annex I , JMD E.P. 37338/1807/ E103 - SPEC 2

Red book: **EN**

Presence status: Migratory species

Ecology: Prefers semi-montane forests and wooded valleys with rivers and marshes. It builds nests with branches in tall trees. It feeds on amphibians and insects that it searches for along rivers, streams and marshes. Withdrawn and inaccessible when nesting, it avoids contact with people. It returns to Greece in April and migrates to Africa until November. It often winds over streams and rivers as well as its nest.

Threats - dangers : The most important threats to the species are the degradation and destruction of the wetland habitats where it feeds, the reduction of its prey due to drying, disturbance and collision with electric cables.

Population estimate: Recorded a total of 11 times in one- and two-person flights and in a standing position in a stream bed. The activity of the species was recorded in high-altitude flights of 100 - 200 m but also descents in gullies and canals. The usual activity was at a distance from the project site in gullies and canals in the wider area. The recordings of the species include field measurements in the wider area and to the east of the project as well as utilizing the data of the online database Movebank .

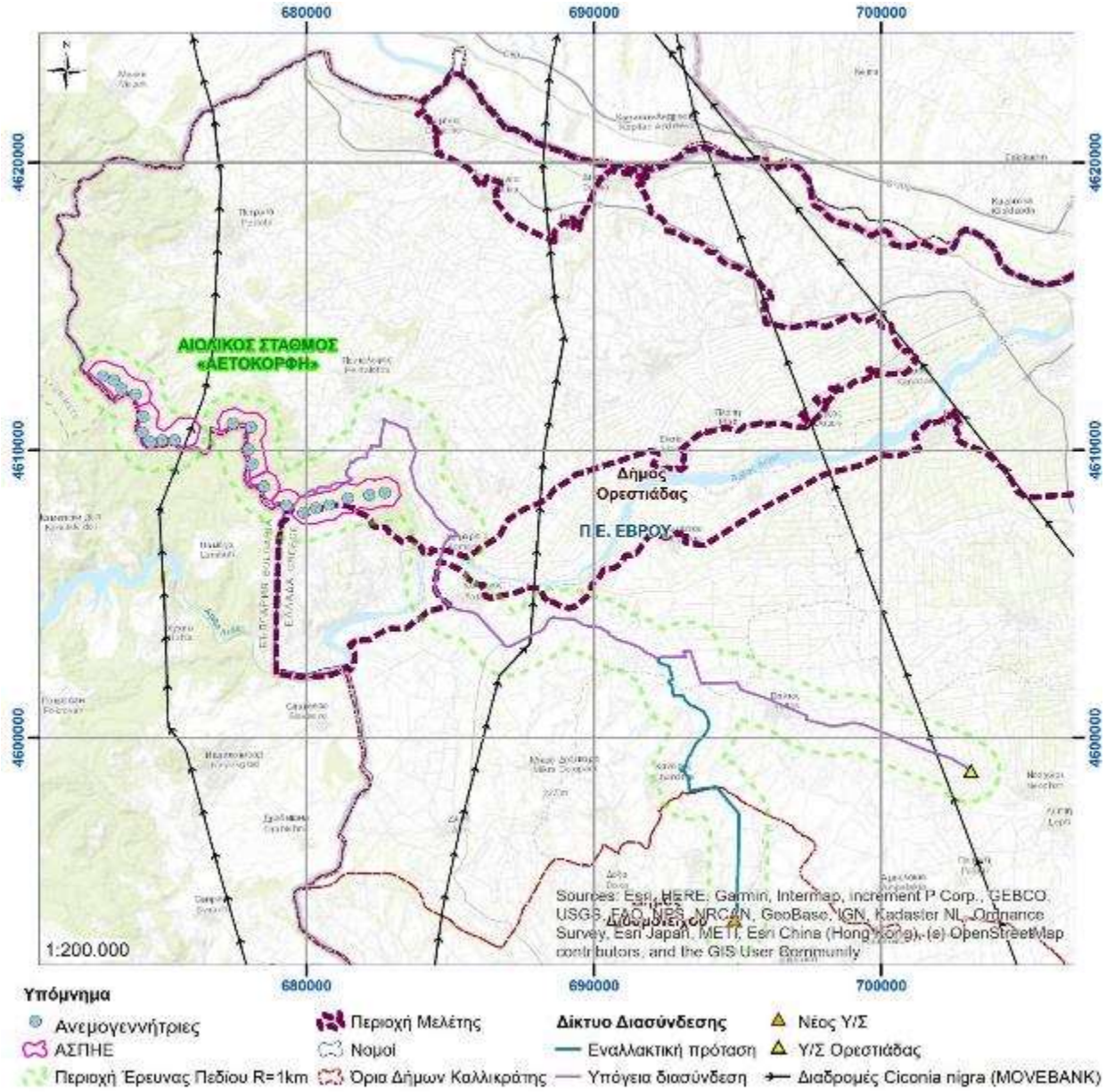

Figure 2-3. Data of telemetry recordings using GPS transmitters for Black Stork (SOURCE: https://www.movebank.org)

2. *Ciconia ciconia* (Stork)

Protection status : JMD E.P.37338/1807/ E103 SPEC 2 Red book: **VU**

Status of presence : migratory species - summer visitor.

Ecology : Breeds in rural areas with access to streams, marshes and flooded areas. It nests in the countryside and in urban areas on a platform with branches up to 30m. from the ground, on trees, roofs, pillars and artificial nests. It feeds singly or in flocks during the day in stagnant water, ponds,

gullies, marshes and farmland. Food consists of aquatic organisms (fish, amphibians, crustacean molluscs), mice and insects.

Threats - risks : The species is threatened by the alteration of the habitats and especially the drainage of the wet meadows. It is also threatened by the use of agrochemicals on crops. Threatened by impingement on cables mainly during migration. .

Population estimate : Recorded a total of 19 times with main activity in the rural areas in the east and around the settlements from March to September. During the spring and summer observations, significant numbers of up to 250 individuals were recorded foraging in threshed and recently harvested fields in the lowland area of Spileo at a distance from the project. The species nests in artificial and natural nests in and near settlements, and uses the agricultural lands of the region for foraging. Typical flights include movements from the nests to the agricultural and barren areas where they forage and return to the nests to carry food to the chicks. Flights are mostly medium and low altitude. The construction of the projects under study has little impact on the species whose presence is found in the rural areas to the east and at a distance from the location of the W/T. At the position of Wind Farm Aetokorfi, no flights were recorded within HDF.

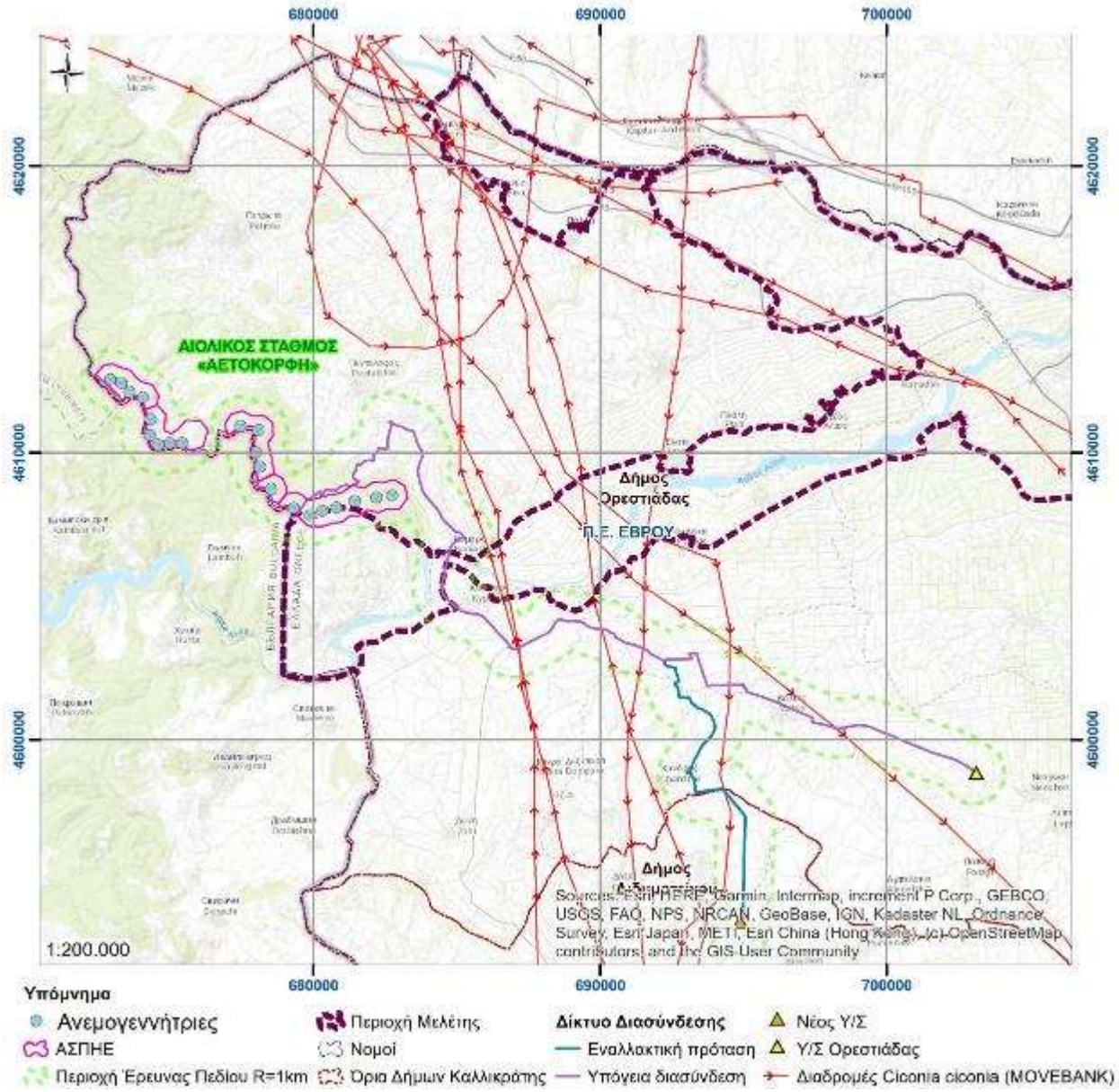

Figure 2-4. Data of telemetry recordings using GPS transmitters for the Stork (SOURCE: https://www.movebank.org)

3. *Microcarbo pygmeus* (Lagona):

Protection regime : JMD E.P.37338/1807/ E103 SPEC 1 Red book: **LC**

Status of presence : type Epidemic.

Ecology : Breeds in colonies in lakes with dense vegetation and in streams, marshes and flooded areas. It nests in trees in colonies, often with various species of herons and in clumps of water trees (willows, poplars, etc.). It feeds on fish often and on arthropods, small molluscs, etc.

Threats-dangers : several people drown by accidental entanglement in fishermen's nets, but they also become victims of poaching mainly due to their confusion, e.g. with Falarida.

Population estimate : Recorded twice, once in June in an irrigation canal in the East of the Wind Farm and once in the south in the lake of the Kamara Dam as part of measurements for Wind Farm boundaries. The species uses the riparian areas, streams and irrigation canals of the region as its habitat. Movements of waterfowl individuals to and from these locations on water surfaces with flights over rural locations are frequent. It was not recorded in the works location

4. *Gyps fulvus* (Vulture)

Protection regime: Annex I , JMD E.P. 37338/1807/ E103 - SPEC 4

Red Book: **VU**

Presence status: Epidemic species

Ecology: Prefers mountainous areas with steep rocky slopes and sparse vegetation, nests on steep slopes, feeds on scavengers of medium and large mammals and rarely large birds, the foraging area extends to a radius of 15-20 km . It winds constantly over ridges.

Threats - dangers: The most important threat to the species is the secondary poisoning which is mostly done by the breeders with poisoned baits in the latter's attempt to fight wolf attacks. Siting wind farms within its foraging radius is a potential threat.

Population estimate: Recorded a total of 4 times throughout the year. Records included flights as high as 200 m . Vulture individuals were recorded mainly in two-person flights but also in single-person flights. The species does not use the area of the projects as a habitat but is a transitory species during its movements from the colony of Dadia to the colony in the area of Bulgaria. Recordings were made at a distance to the south and east on single-pass flights.

The species has a permanent presence in the wider area of Dadia and its activity is increased mainly to the south and west of the project site and the crossings from the site of the projects are clearly less frequent than in the areas west and south of the projects. The use of the Wind Farm area is not frequent and no stands or perches near construction sites were recorded. The importance of the species and its strict protection status must be taken into account and therefore important protection measures and reduction of the impacts from the construction and operation of RES projects are proposed. The location of the projects is located outside the zone of increased protection and exclusion proposed by the WWF in 2013 and outside the limits of the areas - zones of distribution of the species according to Vasilakis' study. According to LIFE program vulture telemetry data VULTURE and the available data of the website Movebank regarding the vulture population in

Bulgaria, the usual flight paths of the two vulture species are NOT located in the area of the projects under study, but are located mainly in the wider area delimited between Soufli and Aisymi with a direction from the NW to the SE.

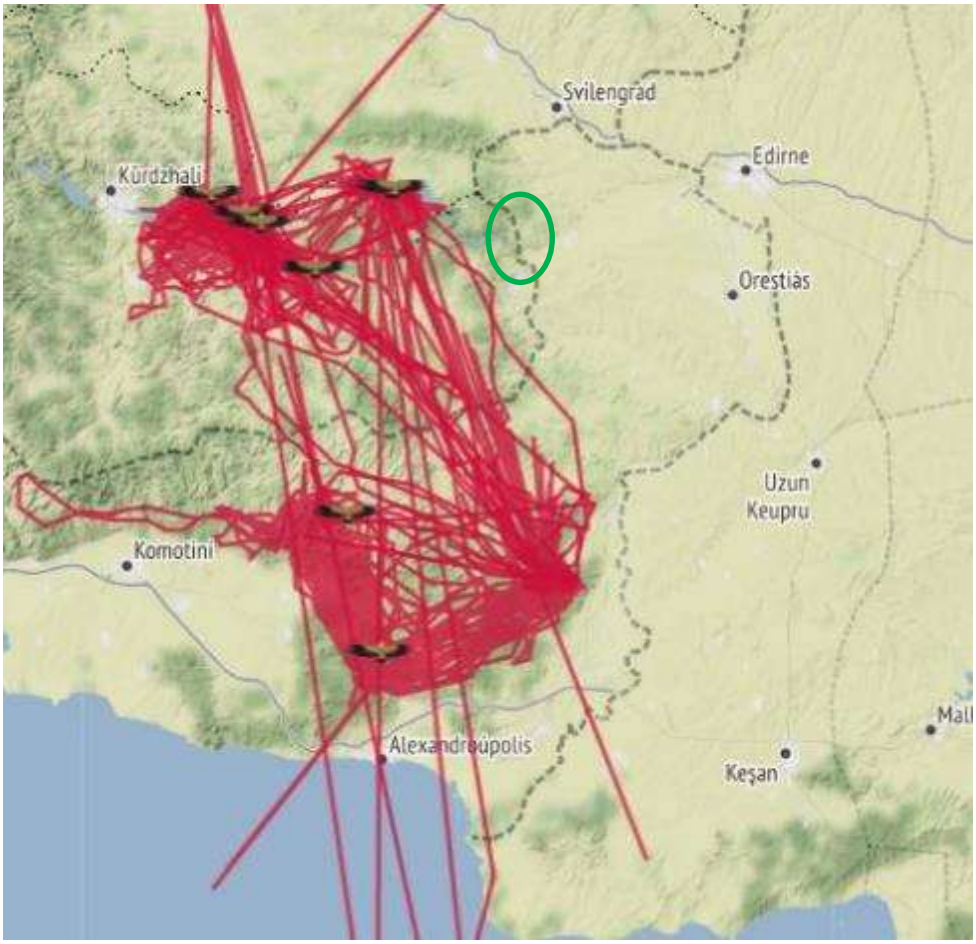

Figure 2-5 : Data from telemetry recordings using GPS transmitters for Vulture - SOURCE: LIFE (VULTURE) for the year 2022

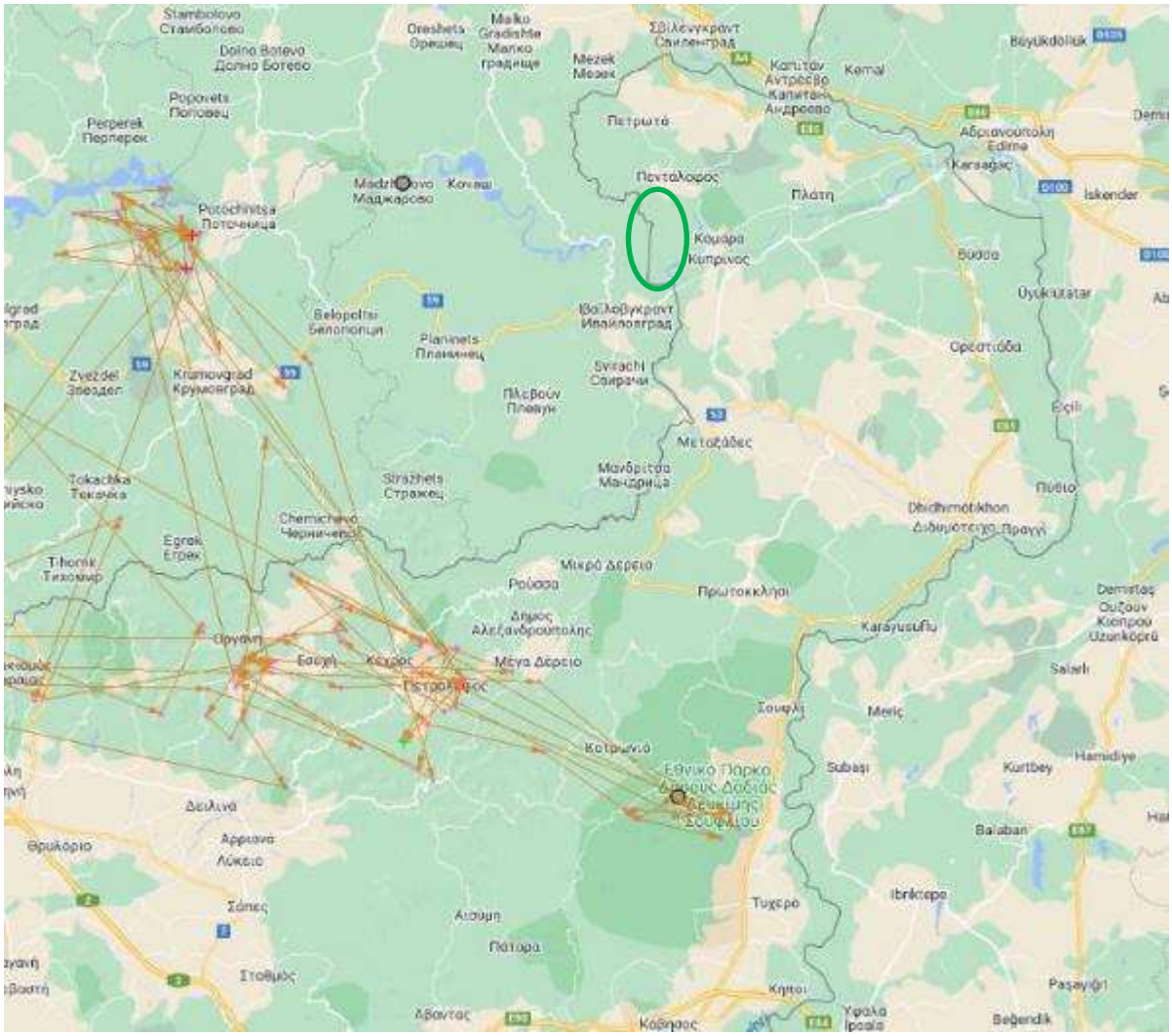

Figure 2-6 : Data of telemetry recordings using GPS transmitters for the Vulture (SOURCE: Vultures Return in Bulgaria https://www.movebank.org) for the period 2016-2022

5. *Aegypius monachus* (Black vulture)

Protection regime: Annex I, JMD E.P.37338/1807/ E103 - SPEC 1 …… *Red book:* **EN**

Presence status: Epidemic species

Ecology: It lives in arid mountainous and lowland areas, it builds a huge nest on a tree. Its feeding habitat is semi-montane forests with gentle slopes and fairly open spaces with low vegetation. The last population of SE Europe is centered in the protected forest of Dadia.

Threats – Risks: Reproduction: The destruction of semi-montane forests and the lack of stands of old trees are a major threat to the species. Also disturbance during the nesting season due to logging activities plays an important role in the reproductive failure of the species (*Adamakopoulos et al* . 1995).

Foraging habitat: Reforestation, afforestation of sparse stands, undergrazing and abandonment of extensive livestock farming are the major threats to the species' foraging habitat.

Immediate threats: The use of poisoned baits to control wolves in mainland Greece played a decisive role in the extinction of the species (*Handrinos,* 1985). Also the use of poisons to control the fox population in the Evros area has resulted in the stagnation of the breeding population in the last decade (*Antoniou et al.* 2005, *Skartsi et al.* 2008). Also in the same area, the surveying and operation of wind farms are a threat that needs monitoring (Ruiz et al. 2005).

Population estimate: Recorded a total of 8 times throughout the year. The recordings mainly involved flights at a high altitude from the ground surface. Three times he flew over the site of the works in high-altitude, downwind flights. According to LIFE program vulture telemetry data VULTURE and the available data of the website Movebank regarding the vulture population in Bulgaria, the usual flight paths of the two vulture species are NOT located in the area of the projects under study, but are located mainly in the wider area delimited between Soufli and Aisymi with a direction from the NW to the SE.

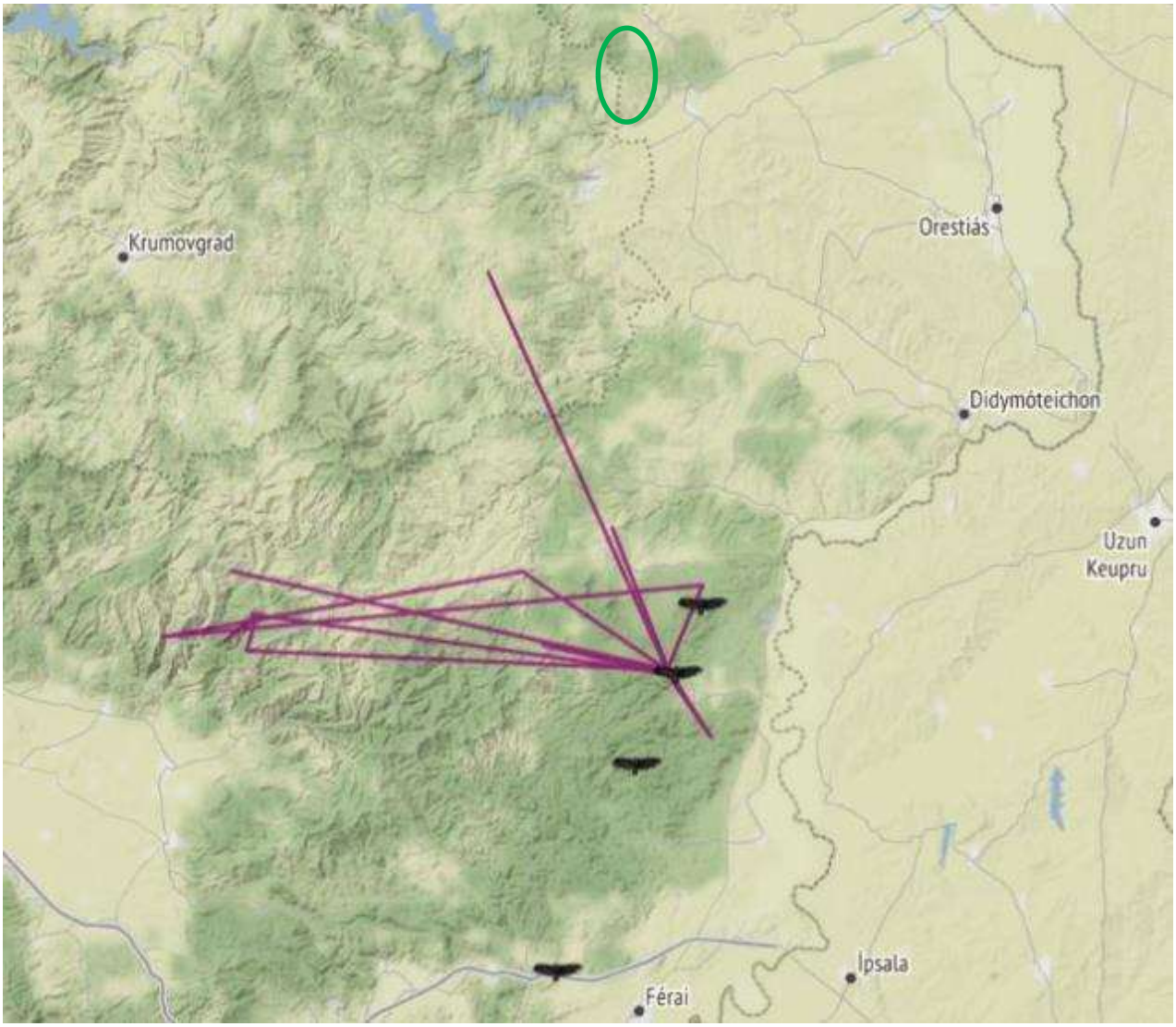

Figure 2-7 : Data from telemetry recordings using GPS transmitters for the Black Vulture (SOURCE: LIFE VULTURE https://life-vultures.rewildingeurope.com/) for the year 2022

6. *Aquila chrysaetos* (Golden Eagle)

Protection status: Annex I, JMD E.P.37338/1807/ E103 - SPEC 3 …… *Red book:* **EN**

Presence status: Epidemic species

Ecology: It is mainly found in mountainous and semi-mountainous areas, while in summer it is often observed in the alpine zone (Xirouchakis 2001). Breeds in mountains and remote mountain forests. Its diet consists mainly of birds and small and medium-sized mammals (e.g. partridges, hares, wild pigeons, pheasants, rabbits but also ferrets, squirrels or foxes) as well as dead animals. It nests mainly in rocks (800 - 2000m, Handrinos 1987) creating a huge nest which it reuses if not disturbed.

Threats – Risks: Breeding: Disturbance near nesting sites is the main threat to nesting habitat.

Foraging habitat: The degradation of its foraging habitats (e.g. abandonment of upland crops), as well as overpredation of certain food staples such as partridge and hare (Xirouchaksi 2001). Also extensive reforestation and natural afforestation of abandoned land have negative consequences on Golden Eagle foraging habitat (Watson 1997).

Immediate threats: The main threats to the species are poaching and the uncontrolled and illegal use of poisons to control "harmful" carnivores.

Population estimate: The species was recorded a total of twelve times. The flights were made at a relatively high altitude. We consider that the species nests at a distance from the location of the works and the use of the space from it is limited.

7. *Clanga pomarina* (Holy eagle)

Protection regime: Annex I, JMD E.P.37338/1807/ E103 - SPEC 2 ……. *Red Book:* **EN**

Presence status: Migratory species - summer visitor

Ecology: Its habitat consists of forest stands of low or medium altitude. It feeds on reptiles, amphibians and rodents, birds and insects. Nests in trees in low wooded areas and valleys in the wetlands region.

Threats - risks: Reproduction: Threatened by deforestation, the cutting of mature trees in lowland areas and in general by anthropogenic disturbances in lowland forested areas.

Feeding habitat: The destruction of riparian vegetation, the conversion of wet meadows into arable land and the use of agrochemicals are the main factors in the degradation of the species' feeding habitat.

Population estimate: Recorded thirteen (13) times in flights in the wider area, six of which in the project area. The wider area of the wetland of the Ardas and Evros water streams constitute the species' habitat The species does not nest near the project and no possible nesting sites were identified in the project's FRA.

8. *Circaetus gallicus* (Snake eagle):

Protection status : JMD E.P.37338/1807/ E103 SPEC 2 Red Book: **NT**

Status of presence : species Migratory (Summer Visitor)

Ecology : breeds in open dry areas with sparse forests, comes to the area as a summer visitor, feeds entirely on reptiles and nests in trees.

Threats - dangers: The destruction of mature forests, forest fires and disturbance due to road opening and logging activities are nuisances for the reproduction of the species. Afforestation of

open lands, overgrazing, abandonment of traditional grazing systems and upland cultivation are threats to the species' foraging habitat. The use of herbicides, pesticides and poisons reduce the availability of its food. Sometimes poaching. (Bakaloudis et al . 2005)

Population Estimate : Recorded in a number of sightings (36) in the wider project area in foraging, display and tree-stopping flights. Many flights were recorded near construction sites of the project. Most of the activity was recorded in the east over open farmland. In addition to the records of the species, we mention the existence and recording of a large number of reptiles (snakes) which are the main type of food of the Serpent Eagle in the wider area of the rural areas of the region (lowlands).

9. *Aquila pennata* (Eagle)

Protection mode: Annex I, JMD E.P. 37338/1807/ E103 - SPEC 3

Red Book: **EN**

Presence status: Migratory species - summer visitor (some individuals winter in Greece)

Ecology: Breeds in forests alternating with open areas in mountainous or semi-mountainous areas. It feeds on reptiles, rodents, birds that it captures in the air near the ground. It nests in trees.

Threats - dangers: The destruction of forests and especially lowland forest lands is the most basic threat to the nesting habitat of the species. The use of agrochemicals in crops affects the reproductive success of the species. The degradation of the species' habitats due to the destruction of forests attributed to agriculture..

Population estimate: Recorded twenty one (21) total times in flights of a mature male individual. Recorded on feeding flights. The activity of the species at the site of the works is frequent. The presence of a large number of micro-birds in the project area increases the probability of its presence.

10. *Milvus* migrans

Protection regime : Annex I, JMD E.P. 37338/1807/ E103 SPEC 3

Red Book : **CR**

Status of presence : Winter visitor, Passing visitor, Epidemic species

Ecology : It is found mainly in lowland and semi-lowland areas with sparse forests, hedges, etc., especially in river valleys with riparian vegetation. It nests in trees. It often forages in crops and garbage dumps. Feeds on a wide variety of vertebrates, large insects and, to a large extent, carrion and garbage

Threats - risks : *Breeding:* Landfill closures and animal housing are major threats to the Ciftis. Also the burial of dead animals and the general abandonment of nomadic animal husbandry is an equally important threat.

Immediate threats: Secondary poisoning due to bait use and to a lesser extent water pollution are major sources of mortality.

Population estimate : Recorded four times during migration in flight and perched in the Ardas bed area away from the works.

11. *Circus aeruginosus* :

Protection regime : JMD E.P.37338/1807/ E103 SPEC 4 Red book: **VU**

Status of presence : migratory species

Ecology : breeds in shallow lakes and rivers. It nests in tall reeds. Common during migration. It feeds on small mammals and birds, amphibians and fish. The foraging habitat includes almost all types of wetland ecosystems.

Threats - risks: Reproduction: Threatened by the burning and clearing of reeds.

Immediate threats: The destruction and shrinking of wetlands and especially wet meadows and areas with shallow water.

Population estimate : Recorded a total of 25 times in the wider area throughout the year and more often during migration. The corncrake uses the wider area around the rivers of Ardas at a distance from the site of the works for foraging, as it was recorded in a number of measurements in the agricultural lands in search of food.

12. *Circus cyaneus* (Winter Circus):

Protection status : JMD E.P.37338/1807/ E103 SPEC 3 Red book: NO

Status of presence : migratory species

Ecology : breeds in wetland areas with plenty of vegetation, also in heaths, open hills, etc. It nests on the ground and feeds on small mammals and birds.

Threats - risks: Reproduction: The destruction and shrinking of wetlands and especially the draining of marshes. Also the afforestation and grazing of the open lands.

Population estimation : seven recordings were made in flights in the area north and east of Wind Farm in the riparian and marshy areas of the rivers Ardas and Evros during the period of November - February measurements. It was found in the area of agricultural crops at the locations of the

planned projects. In one recording, it rose from a standing position in a field near the site of the project.

13. *Buteo buteo* (Geracina)

Protection mode: SPEC 4

Red Book: **NE**

Status of presence: Type epidemic

Ecology: One of the most numerous predators in Europe. Common species, found in a variety of habitats (forests, crops, plains, wetlands, etc.) in abundance, with increasing trends in recent years. It feeds mainly on rodents, reptiles and birds and often also on carnivores.

Threats - risks: A significant number of individuals, especially the wintering population of the species, are directly killed by humans.

Population estimate: It is a permanent species in the project area. Activity at the project site is continuous throughout the year in foraging and territorial flights. Recorded 47 times in flights and perches. The species has shown a very high adaptation to anthropogenic interventions and corresponding RES projects and it is estimated that there will not be a significant and irreversible impact on the species.

14. *Pernis apivorus* (Pernis apivorus)

Protection regime: Annex I, JMD E.P. 37338/1807/ E103 - SPEC 4

Red Book: **LC**

Presence status: Migratory species – summer visitor

Ecology: Breeds in wooded areas with openings, fields, small wetlands. It feeds on the larvae and nests of wasps and bees, as well as honeycombs, reptiles, amphibians and chicks. It nests in trees and the nest lined with fresh leaves.

Threats – risks: Deforestation and removal of mature trees degrades the species' nesting habitat. During the breeding season logging and forest recreation activities. A significant threat is the afforestation of forest clearings and the destruction of its main food categories (wasps - bees) due to the use of insecticides.

Population estimate: Recorded twice at the end of August and on 27 September during the migratory season. The presence of the species during the summer season is anticipated.

15. *Accipiter* nisus

Protection mode: - SPEC 4

Red Book: **NE**

Presence status: Epidemic species

Ecology: Widespread epidemic species and common winter visitor. It breeds in wooded areas, but also near settlements. Every year it builds a new nest in a tree, feeds on small birds.

Threats - risks: Deforestation and extensive clearing

Population estimate: In total it was recorded four sixteen (16) times in foraging flights throughout the forested area at the project sites and on the side of the Bulgarian territory.

16. *Accipiter brevipes* (Saini)

Protection regime: Annex I, JMD E.P. 37338/1807/ E103 - SPEC 2

Red Book : **NE**

Status of presence : Summer visitor, Passing visitor

Ecology : A typical woodland species, the Xefteri nests in trees, mainly preferring deciduous forests with several clearings as well as river valleys with tall trees or bushes. It often breeds on single trees near crops or rivers but even in forest plantations (e.g. White plantations). The species feeds mainly on small mammals, birds, reptiles and large flying insects (e.g. locusts, cicadas, etc.) which it hunts in forest clearings, or in the nearest agro-systems and meadows as well as near riverbeds in riparian vegetation .

Threats - dangers: Breeding habitat : The destruction of forests and the absence of suitable trees for nesting are the main threats to the reproduction of the species.

Foraging habitat : Agricultural intensification with extensive use of insecticides, destruction of riparian ecosystems due to urban or tourist development, and disturbance due to recreational activities degrade foraging habitat. Also since the species feeds on reptiles, climate changes with extreme phenomena that result in a decrease in their activity negatively affect the reproductive success of the species).

Population estimate : Recorded once in flight from perch to tree and in flights at a distance from the works site. The presence of the species is given by records of the study group earlier in the context of the study of a neighboring RES project.

17. *Falco* tinunculus

Protection mode: SPEC 4

Red Book: **NE**

Presence status: Epidemic species

Ecology: Common in open areas, scrub and open forests, rocky hills, etc. Feeds on small rodents, insects, chicks, reptiles, worms and amphibians. It nests in trees, rocks, buildings and quarries.

Threats - risks: Foraging habitat: The intensification of agriculture combined with the extensive use of pesticides, the afforestation of grasslands result in the degradation of the hunting habitat.

Population estimate: The species nests in the wider area. Recorded on numerous flights throughout the year. Uses project location extensively with short-duration active foraging flight. In numerous records it was found at the sites of the works in search of food and on perches. The location of the works is a habitat area for the species.

18. *Falco peregrinus* (Petritis):

Protection regime: Annex I of the JMD E.P. 37338/1807/ E103

Red Book: **LC**

Status of presence: epidemic species and winter visitor

Ecology: prefers open areas with woody vegetation or high rocks, usually nests on rocks and steep slopes, feeds exclusively on birds.

Threats - dangers: capture of chicks for sacrificial hunting, reduction of its food items, locally from disturbances in its nest.

Population estimate : Recorded once in flight of one individual to the west of the project. The presence of a breeding pair in the area of the Bulgarian NATURA 2000 area is verified.

19. *Falco columbarius* (Falco columbarius)

Protection regime: Annex I of the JMD E.P. 37338/1807/ E103

Status of presence: Winter visitor

Red Book: **NE** SPEC 4

Ecology: open land species frequents crops, grasslands and grasslands but also wetlands. It feeds mainly on small birds, mid-air birds, small mammals and insects

Threats - risks: The residential and touristic development of the coastal areas, the degradation of wetland ecosystems and the intensification of agriculture are the main threats to the species.

Population estimate : Recorded once at a distance from the project to the west towards the area of the artificial lake Ivailovgrad. The inclusion of the species in the list of species for the project under study results from the data of the NATURA 2000 area BG0002106.

20. *Falco subbuteo* (Falco subbuteo)

Protection status: Red Book: **NO**

Status of presence: Summer visitor - stipend

Ecology: The tree elder likes to live in areas with sparse stands of trees, olive groves, forest edges or even cultivated areas and open diverse landscapes. Sparse pines and, more rarely, deciduous or riparian forests are preferred. Especially during migration, it can be seen in warm and humid places, suitable for insectivorous birds. The woodpecker has as its main diet large insects and small birds.

Threats - risks: The intensification and industrialization of agriculture combined with the extensive use of pesticides and hunting are threats. Also the abandonment of traditional agricultural and livestock practices and the afforestation of grasslands result in the loss or degradation of hunting habitat.

Population estimate : The species was recorded once in the forest west of Therapio settlement at a distance from the site of the works.

21. *Columba palumbus* (Fassa)

Red Book : **NE**

Presence status : epidemic, Winter visitor

Ecology : Although it shows a greater breadth in its choice of habitat, it remains mainly in oak forests. Often, large flocks roost in groups in whitecrops in wetlands, lowlands and semi-lowlands. In more southern areas, sometimes in more open habitats (maki, etc.). Feeds on plant food (seeds, tender leaves, flowers, etc.), both on trees and on the ground

Threats - risks : Although it does not seem to be in danger, the bad or defective application of forestry practices (deforestation, etc.) seems to negatively affect the breeding population. Forest fires are a more serious problem, especially in areas (islands, etc.), where the breeding population is already small. Popular game species, likely to be poached locally.

22. *Streptopelia turtur* (Wren)

Protection regime: Annex II/2, JMD E.P.37338/1807/ E103 - SPEC 3

Red Book: **NO**

Status of presence: Migratory - summer visitor

Ecology: Breeds in lowland forests and stands of trees with a rich canopy, in rural and other open areas. It feeds on the ground with plant food, while it nests in large bushes and trees.

Threats - risks: Intensification of agriculture, mainly through reforestation, destruction of hedges, pesticides, etc., poaching and overpredation.

Population assessment : The species was recorded in numerous measurements in the area of the projects in the period May - September with very intense activity mainly in May. Common records on perches on tree branches and on short flights.

23. *Cucuclus canorus* (Cuckoo)

Protection mode: SPEC 4

Red Book: **NE**

Presence status: Epidemic species, partly migratory

Ecology: Breeds in a variety of forests and woodlands. It parasitizes various species of birds where it uses their nests. It feeds on insects and caterpillars.

Threats - risks : The species is not threatened

Population estimate: Heard in calls during March – August mainly at a distance from the project sites in wooded areas.

24. *Strix aluco* (Squirrel):

Protection regime : - SPEC 4 Red book : NE

Status of presence : epidemic species

Ecology: Permanent resident in wooded areas, with a preference for old deciduous trees. Often in populated areas near forests. Nocturnal, it feeds on rodents and insects on the ground. .

Threats – risks: its habitat is decreasing due to residential development.

Population estimate : During breeding calls of the species, answered from a wooded position to the west.

25. *Bubo bubo* (Bubo) :

Protection status: JMD E.P.37338/1807/ E103SPEC 3 Red book: LC

Status of presence: epidemic species.

Ecology : wide range habitat, in forests and usually on steep rocky slopes near water, nests in holes and rock cavities, feeds on mammals and birds, species sensitive to human presence.

Threats - dangers: the most important threat is illegal hunting, road constructions, locally from forest fires.

Population estimate : The species was recorded a total of six times from the west side of the project and within the Bulgarian territory. The listening position is estimated to be on a rocky outcrop at a distance of approximately 2500 m from Polygon B.

26. *Otus scops* - Gionis :

Protection status : *SPEC 2* *Red book : NE*

Status of presence: epidemic species.

Ecology : wide range habitat, in forests and usually on steep rocky slopes near water, nests in holes and rock cavities, feeds on mammals and birds, species sensitive to human presence.

Threats - dangers: the most important threat is illegal hunting, road constructions, locally from forest fires.

Population assessment : The species was recorded several times by the call reproduction method using a special sound reproduction machine, mainly around the settlements in the east of the project.

27. *Caprimulgus europaeus* (Caprimulgus europaeus)

Protection regime : Annex I, JMD E.P.37338/1807/ E103 - SPEC 3

Red Book : **LC**

Status of presence: immigrant

Ecology : The buzzard prefers dry, warm, open landscapes with a sufficient amount of insects during night flights. It prefers rocky, sandy open areas with maquis and sometimes on sand dunes with low vegetation. Its diet consists of various flying insects, with the majority of its prey being Lepidoptera and Coleoptera. There is no nest, since the female gives birth directly on the ground or on dry leaves and, in fact, many times when she incubates the eggs, she moves them under her body when she changes position.

28. *Apus apus* - Ashtray :

Protection status : - SPEC 4 Red book : NE

Status of presence : migratory summer visitor.

Ecology : lives in open rocky areas, nests on cliffs, feeds on insects, catching in the air or on the ground.

Threats - risks : it is not known if it is at risk from specific causes.

Population estimate : observed from May to September counts in numerous flights of 4 to 10 individuals.

29. *Merops apiaster* (European bee-eater)

Protection status : Red book : **NE**

Presence status : Summer visitor, migratory species

Ecology : The bee-eater builds its nest in a gallery on the ground on inclined or vertical slopes. The soil conditions are an important parameter for the selection of a sloping site for the establishment of the colony. The Honeyeater feeds on insects, largely preferring Hymenoptera which make up over 60% of its diet. It uses the tops of trees or telegraph poles to monitor and locate its prey which it captures in flight. It prefers sunny, warm places in extensive crops, valleys, meadows, open areas, olive groves or vineyards usually near surface water.

Threats - dangers: An important threat to the species is the direct killing of adults both in colonies and during migration by poachers. Although in our country the hunting of honeybees is prohibited, even today there are not a few cases of poaching. An important parameter which also limits the populations of the Bee-eater is the lack of suitable nesting sites.

Population estimation : It was recorded in a number of measurements in flights in the fields of agricultural crops to the east of the project, but also in nesting sites in the form of a colony on slopes along the streams and Ardas and on artificial slopes of roads in the wider area. The recordings were made May - September. A significant number of bee-eater nests and individuals were recorded on the slopes of a trench (old quarry) in the south-southeast of the Krios settlement.

30. *Coracias garrulus* (Copper garrulus):

Protection status : JMD E.P.37338/1807/ E103 SPEC 2 Red book: **VU**

Status of presence : migratory summer visitor

Ecology : Breeds in arid, open areas, crops with scattered trees and abundance of large soil insects. It nests in holes in trees, buildings or road slopes. .

Threats - risks : A significant threat to the species is the intensification of agriculture through which extensive crops with scattered trees suitable for nesting are converted into open intensive crops. Also, the extensive use of agrochemicals in crops reduces the food availability of the species and has a negative effect on the populations of the species.

Population estimate : recorded in numerous recordings of single individuals in flight and perching on trees and wires. The recordings were made between May and August.

31. *Upupa* epops

Protection mode: SPEC 3

Red Book: **NE**

Presence status: Migratory species - summer visitor

Ecology: Inhabits and breeds in rural, open areas with abundant woody vegetation and sparse forests, pastures and city parks. It spends most of its time on the ground and feeds on insects, which it catches in the air or on the ground. It nests in holes in trees, walls, dry rocks, etc.

Threats - risks: It is not known if it is at risk from specific causes.

Population estimate : It was recorded in a number of measurements in the wider area mainly within agricultural crops.

32. *Picus viridis* (Green Woodpecker)

Protection status : Red book : **NE**

Status of presence: epidemic species

Ecology : THE Green Woodpecker prefers low altitude regions with ripe forests , mainly leafhoppers , which they are adjacent with open regions e.g gaps , meadows , crops with scattered old man trees , gully arboreal vegetation e.g willows , poplars . THE availability suitable ones of trees for nesting increases with the rate ripe forest , while the habitat feeding of is characterized from high structural heterogeneity as seats with ripe Forest and high up trees they alternate with open lands , meadows the spaces of forest where is rich in colonies of ants the in fruit carrier trees .

Threats - risks: The main threats are related to the degradation/destruction of the critical habitats of the species. This degradation is mainly based on the intensification of forestry with the felling of mature stands, the abandonment of traditional animal husbandry in the agroforestry areas, the destruction or alteration of stream vegetation in rural landscapes. The gradual afforestation of gaps, natural openings or meadows is also a threat.

Population estimate : Recorded mainly in the spring with drumming on logs in the oak forests around the works.

33. *Dendrocopos medius* (Medium Woodpecker):

Protection regime: Appendix I, JMD E.P. 37338/1807/ E103

Red book: **LC**

Status of presence: epidemic species

Ecology: The Middle Woodpecker prefers mature deciduous forests (mainly oak forest), riparian forests or even olive groves. The age of the forests, their total area and the degree of isolation are important selection factors at the spatial level of the landscape. In its territories, the species chooses places in the forest with mature trees and high percentages of dead trunks or old trees.

Threats - risks: The main threats are related to the degradation / destruction of the critical habitats of the species. This degradation is mainly based on the intensification of forestry with the felling of mature stands of deciduous forests and the gradual reduction of the total biomass of mature forests (especially oak forests). Also, a threat to the species is the removal of dead trunks from the stands through logging operations. At the spatial level of the landscape, an important threat is the fragmentation of deciduous forests.

Population estimate : Recorded while foraging on tree trunks.

34. *Dryocopus martius* (Black Woodpecker):

Protection regime : Annex I, JMD E.P.37338/1807/ E103

Red Book : **LC**

Status of presence : epidemic species

Ecology : The Black Woodpecker prefers mature forests of both deciduous and coniferous trees. The availability of suitable trees for nesting increases with the percentage of mature forest and dead standing logs. Its foraging habitat is characterized by high structural heterogeneity as sites with mature forest and tall trees alternate with open areas, grasslands or forest gaps where they are rich in ant colonies.

Threats - risks : The intensification of forestry with the felling of mature forest stands and the removal of dead standing trees threaten the species at the spatial level of the territory. Gradual afforestation (eg artificial reforestation of conifers in deciduous forests) of forest gaps negatively affects the foraging habitat of the species, reducing the heterogeneity of the forests.

Population estimate : Recorded three times in flight through the forest.

35. *Dendrocopos syriacus* (Balkan Woodpecker) :

Protection status : JMD E.P. 37338/1807/ E103 SPEC 4 Red Book : NE

Status of presence : epidemic species

Ecology : prefers the habitat of oak forests and less beech, probably nests in the area, nests in tall mature trees,

Threats - risks : it is not known if it is at risk from specific causes, possibly from excessive deforestation

Population estimate : it was recorded several times in the oak stands at the sites of the works and throughout the ridge of Aetokorfi.

36. *Alauda arvensis* (Starithra):

Protection regime : - SPEC 3 Red book : NT

Status of presence : epidemic species.

Ecology : terrestrial, in fields and barren lands, feeds on seeds of wild grasses and invertebrates. It builds nests on bare ground or under grassy plants. It nests in mountainous areas and usually visits the fields in winter.

Threats - risks : intensification of agriculture, use of agrochemicals, reduction of animal husbandry and natural afforestation of meadows and bare areas.

Population estimation : several individuals were recorded in a number of measurements within FRA in agricultural crops.

37. *Galerida cristata* - Katsoulieris :

Protection mode : -SPEC 3 *Red book :* NE

Status of presence: epidemic species.

Ecology: terrestrial, in fields and barren lands, feeds on seeds of wild grasses and invertebrates. It builds nests on bare ground or under grassy plants. Its habitat is open, dry, plain or hilly areas with sparse vegetation .

Threats - risks: intensification of agriculture, use of agrochemicals, reduction of animal husbandry and natural afforestation of meadows and bare areas.

Population estimate: a significant number of individuals were recorded in a number of records in and around fields and along rural roads.

38. *Calandrella brachydactyla*

Protection regime : JMD E.P.37338/1807/ E103 SPEC 3 Red book: NO

Status of presence : summer visitor, passerby

Ecology : Builds its nest on the ground, usually under or near low vegetation (Cramp, 1998). Nest site selection is based on two conflicting standards. The first concerns the necessity of covering or shading the nest from the sun's rays, which helps in the optimal rearing of the chicks and leads to

the selection of places under vegetation. The species prefers open areas with bare, sandy or stony soil in the presence of sparse vegetation, as well as areas with thallophytes or low intensity crops (Handrinos & Akriotis , 1997; Tucker & Heath , 1994; Serrano , & Astrain , 2005). The density of pairs in suitable areas ranges from 2 to 5 pairs per hectare, while aggregations of 10 – 20 pairs are quite often observed in one area. It feeds mainly on insects and fruits during the breeding season, while the rest of the year it lives on fruits. It collects its food from the ground while it has been observed to feed on low bushes. The availability of insects influences the choice of foraging habitat and intensive crops where extensive use of agrochemicals is usually avoided.

Threats - risks : expansion - intensification of annual crops, due to the use of agrochemicals, tillage, abandonment of traditional agricultural practices and land uses.

Population estimate : Found in the wider area, and in agricultural lands. It was recorded during the summer months, mainly in the southeast near the settlements Therapeio, Fylakio, Valtos, Doxa.

39. *Melanocorypha calandra (Calandra)*

Protection regime : JMD E.P.37338/1807/ E103 SPEC 3 Red book: VU

Status of presence : migratory, breeding

The cologne : It builds its nest in the ground and its eggs and the incubation lasts 16 days. Chicks fledge after 10 days. during the incubation period it also feeds on insects. It feeds on seeds, but also on insects during the incubation period. It is a migratory bird with a light flight and melodious chirping with the ability to imitate the chirping of other birds.

Threats - risks : collection, expansion - intensification of annual crops, due to the use of agrochemicals, tillage, drainage, abandonment of traditional agricultural practices and land uses.

Population estimate : It is found in the wider area, and in agricultural lands, it was recorded several times at lower altitudes than the location of the works in bushy places.

40. *Lulula arborea* (Lulula arborea)

Protection regime: Annex I, JMD E.P. 37338/1807/ E103 - SPEC 2

Red Book: **LC**

Presence status: Epidemic species

Ecology: A breeds in open forests, mainly conifers and broadleaves, in clearings and scrublands. It nests in semi-mountainous and mountainous areas.

Threats - risks: It is not known if it is at risk from specific causes.

Estimated population : It was recorded in places of barren and meadow lands and in bare places but also within FRA in gaps in the oak forest.

41. *Hirundo rustica – Barn swallow:*

Protection mode: SPEC 3

Red Book: **NE**

Presence status: Migratory species – summer visitor

Ecology: Common in rural areas and villages, hunts insects low above the ground and in treetops. K constructs his nest from mud which he mixes with plant material so as to form a cone-shaped nest.

Threats - risks: The main threats are related to the degradation/destruction of the critical habitats of the species. The drying up of wetlands and the lack of places with surface water and mud near urban centers has a negative effect on swallow populations.

Population estimate : recorded in spring and summer on foraging flights and carrying food to nests in large numbers.

42. *Delichon urbicum* (House swallow)

Protection mode : SPEC 2

Red Book : **NE**

Status of presence: species migratory summer visitor

Ecology : Breeds in colonies in cities and villages but also on rocks in open areas.

Threats - risks : there are no significant threats to the species

Population estimate : recorded in spring and summer on foraging flights and carrying food to nests in large numbers.

43. *Motacilla c inerea* (Ash susourada) :

Protection status : Red book *:* **NE**

Status of presence : an epidemic species

Ecology : Nests in streams and river flats, halophytic vegetation, rice paddies and wet meadows. In winter many people gather in the city. We can observe them mainly in streets, squares, ravines, ports, but also on rooftops. It feeds on insects and other small invertebrates.

Threats - risks : The main threats are related to the degradation / destruction of the critical habitats of the species. This degradation is mainly based on the drying and yielding of wet meadows and

marshes to crops and the residential development in these areas. Also, intense grazing in meadows and wetlands is likely to have a negative effect.

Population estimate : Recorded mainly near wetlands and in bushes and trees. In the winter measurements it was also recorded within agricultural crops.

44. *Motacilla alba* – (White-bellied wagtail) :

Protection status : SPEC 4 Red book : NE

Status of presence: epidemic species

Ecology : Breeds in a wide variety of habitats, usually near water, from mountain streams to rocky shores. The nest is created in walls, stones and banks. It feeds on insects.

Threats - risks : The degradation of food habitats.

Population estimate : Recorded for almost the entire year of field measurements. Individuals and groups of 2-3 individuals were observed in bushes and grasslands during bivalves in the study area. More intense activity of the species was observed in the period August - September.

45. *Anthus campestris* - (Ochrokelada) :

Protection regime: JMD E.P.37338/1807/ E103 SPEC 3 Red book: LC

Status of presence: summer visitor

Ecology: It has a wide distribution in mainland Greece. It builds its nests on the ground.

Threats - risks: The intensification of agriculture is considered the main threat to the species. The afforestation of grasslands and the abandonment of gentle low-intensity traditional animal husbandry. Residential development through the creation of large residential units.

Population estimate: Recorded during summer field surveys. Common recording sites are subalpine meadows and standing on stones and rocks on the ground.

46. *Anthus pratensis* (Meadow grouse) :

Protection regime :- SPEC 4 Red Book : NE

Presence status : Winter visitor

Ecology : Overwinters in open areas in fields, meadows, grasslands and sparse olive groves.

Threats - risks : The intensification of agriculture is considered the main threat to the species.

Population estimate : Recorded five times outside FRA near fields.

47. *Troglodytes troglodytes* (European Woodpecker) :

Red Book : **NE**

Status of presence : summer visitor

Ecology: It has a wide distribution in mainland Greece. It builds its nests on the ground.

Threats - risks : The intensification of agriculture is considered the main threat to the species. The afforestation of grasslands and the abandonment of gentle low-intensity traditional livestock farming. Residential development through the creation of large residential units.

Population estimate: Recorded mainly in spring (March – June) in bare areas and in agricultural areas.

48. *Erithacus rubecula* – Red-throated:

Protection Mode: - SPEC 4

Red Book: **NE**

Presence status: Epidemic species

Ecology: Breeds in forests and clearings, nests in tree hollows, feeds on insects, snails and worms.

Threats - risks: It is not known if he is at risk from specific causes.

Population estimate: Recorded repeatedly throughout the year in significant numbers. Strong presence in Autumn and winter (November – February).

49. *Phoenicurus ochruros* (Carvouniaris)

Red Book: **NE**

Presence status: Epidemic species – winter visitor

Ecology: Breeds on rocky mountain slopes with cliffs, sedges and scattered bushes. In winter in open bushy areas, in olive groves, on coasts, in archaeological sites, etc. It nests in recesses of rocks or buildings.

Threats - risks: It is not known if it is at risk from specific causes.

Population estimate: Recorded in numerous counts throughout the FRA with intense activity in Autumn and Winter.

50. *Phoenicurus* phoenicurus

Red Book: **NE**

Presence status: Migratory species – summer visitor

Ecology: It usually breeds in old deciduous or mixed forests and in gardens, parks, etc. It nests in tree holes and in artificial nests.

Threats - risks: It is not known if it is at risk from specific causes.

Population estimate: Recorded mainly in shrubs and trees .

51. *Saxicola rubetra* (Brown-throated)

Protection mode : - SPEC 2

Red Book : **NE**

Ecology : Bird of open areas. Breeds in uncultivated, usually wet areas such as dense pastures, riparian zones, wetlands, fern slopes. Also in clearings in mountain forests and alpine meadows. It feeds on insects. It builds a nest in tufts of tall grasses.

Population estimate: Recorded in numerous counts in rural areas and in bushland.

52. *Saxicola rubicola* (Black-throated Warbler)

Protection status : Red book : **NE**

Status of presence : epidemic species.

Ecology : Typical bird in open areas with low vegetation, low and thorn bushes.

Threats - risks : The intensification of agriculture and monocultures, The abandonment of agriculture and animal husbandry and the afforestation of open areas..

Population estimate: Recorded in numerous counts in rural areas and in scrub often on roads and wasteland.

53. *Oenanthe Oenanthe* (Cinderella)

Protection Mode: - SPEC 3

Red Book: **NE**

Presence status: Migratory species – summer visitor

Ecology: Breeds in open, stony areas, pastures and agricultural land with dry boulders, mainly at high altitude above the tree belt. Insect food, nest in rock recesses, dry rocks, etc.

Threats - risks: It is not known if it is at risk from specific causes.

Population estimate: Recorded in a number of measurements in wasteland, agricultural land and in bushland.

54. *Turdus philomelos* - (Common thrush) :

Protection status : SPEC 4 Red book : NE

Status of presence: epidemic species.

Ecology: breeds in broadleaf and coniferous forests, nests in bushes and trees, Breeds in March.

Threats - dangers: The main threat is overpredation.

Population estimate : recorded in flights and perches in trees in the surrounding forests and in trees along the access roads of the wind farm.

55. *Turdus pilaris* - (Cedar thrush) :

Protection status : SPEC 4 Red book : NE

Status of presence: epidemic species.

Ecology: breeds in broadleaf and coniferous forests, nests in bushes and trees, Breeds in March.

Threats - dangers: The main threat is overpredation.

Population estimate: recorded 10 times in flights of mainly two individuals in scrub and fir forests at forest edges and on the way to the wind farm.

56. *Turdus* merula

Protection regime: Annex II/2, JMD E.P.37338/1807/ E103 - SPEC 4

Red Book: **NO**

Presence status: Epidemic species – winter visitor

Ecology: Lives in broadleaf forests and scrublands, feeds on insects, earthworms, fruits. It nests in bushes and trees and rarely on the ground. Breeds in March.

Threats - risks: It is not known if it is at risk from specific causes .

Population estimate: Recorded in numerous counts on trees and shrubs in the FRA area and in streambeds.

57. *Iduna* pallida :

Red Book : **NE**

Presence status : Migratory species, Summer visitor

Ecology : Breeds in open wooded areas, thickets (and small town parks), orchards, thickets with scattered trees, along streams (woods).

Population estimate: Recorded occasionally in bushes and trees.

58. *Hippolais olivetorum* (Hippolais olivetorum):

Protection regime: Annex I, JMD E.P. 37338/1807/ E103 SPEC 4

Red Book: **NT**

Presence status: summer visitor and breeds in the study area from early May to late July. The breeding population of the species in the study area is estimated at 30 – 40 pairs.

Ecology: It nests in branches of low trees or in dense vegetation of bushes, usually at a low height from the ground (30 – 350 cm) . It prefers sparse oak forests mixed with meadows or cereal crops, oak forest islands in rural areas, oak forest ecotone with agricultural crops as well as in some locations olive groves . The species feeds on insects during the breeding season while supplementing its diet with fruits in the fall. The largest percentage of its food, it secures through the dense vegetation of the bushes and secondarily from the ground.

Threats - risks: The main threats are related to the degradation / destruction of the critical habitats of the species. This degradation is mainly based on the frequent occurrence of large fires in the breeding areas, the felling of sparse oak forests and the reduction or abandonment of animal husbandry. Also, the use of agrochemicals may have a negative effect on the availability of food sources of the species in rural areas.

Population estimate: Recorded 3-4 times in single bushes and 2 individuals.

59. *Sylvia communis* :

Protection mode : SPEC 4 Red Book : NE

Presence status : migratory species, summer visitor.

Ecology : in thickets and sparse forests, nests in low bushes, feeds on insects. Prefers broadleaf evergreen shrubs and low maquis vegetation.

Threats – dangers : The recurrent forest fires in maquis vegetation and evergreen broadleaf scrub. Cutting bushes during the breeding season..

Population estimate : recorded in bordering forest and shrubland and partly on individual trees and bushes in crops.

60. *Sylvia* melanocephala:

Protection mode : - SPEC 4

Red Book : **NE**

Status of presence : epidemic species

Ecology : The Black-tailed Godwit is found in areas dominated by broad-leaved evergreens and dense low maquis vegetation and feeds on insects during the breeding season while supplementing its diet with fruits in the fall.

Threats - risks : The main threats are related to the degradation / destruction of the critical habitats of the species. This degradation is mainly based on the frequent occurrence of large fires in the breeding areas as well as the cutting and removal of bushes.

61. ***Phylloscopus trochilus*** (Phylloscopus trochilus) :

Protection mode: SPEC 4

Red Book: **NO**

Presence status: Migratory species – Passerby during migration

Ecology: Among the most common birds of N. Europe, with a wide range of breeding habitats, the presence of a few trees or tall bushes is sufficient. It feeds mainly on insects and other invertebrates.

Threats - risks: It is not known if it is at risk from specific causes .

Population estimate : recorded in bordering forest and scrubland and in riparian forest environments.

62. ***Phylloscopus collybita*** :

Protection mode: SPEC 4

Red Book: **NO**

Status of presence: Migratory species - winter visitor, rarely epidemic in Greece

Ecology: Usually breeds in open forests with tall trees, clearings and moderate canopy. Winter visitor, also found in cities, gardens, etc. Vaulted nest in the ground.

Threats - risks: It is not known if it is at risk from specific causes .

Population estimate : recorded in forest and shrub borders and in riparian forest environments.

63. ***Muscicapa striata*** :

Protection mode: SPEC 3

Red Book: **NO**

Presence status: Migratory species – summer visitor

Ecology: Breeds in gardens, parks and forests, usually in openings and clearings. Nest in a recess in logs or buildings, often in branches of climbing shrubs.

Threats - risks: It is not known if it is at risk from specific causes .

Assessment population : was recorded at a distance from the project in tree and shrub stands within FRA.

64. *Ficedula semitorquata* (Flyerfly) :

Protection regime: Annex I, JMD E.P. 37338/1807/ E103 - SPEC 2

Red Book: **DD**

Presence status: Migratory species – summer visitor

Ecology: Breeds in deciduous or mixed forests, riparian forests, etc. in a few areas in Greece, mainly a summer visitor.

Threats - Risks: Existing silvicultural management practices, which are primarily concerned with maximizing timber harvest and thus remove old, old, misshapen, diseased, rotten and dead trees, thereby depriving these species of suitable nesting sites and important sources of food.

Population estimate: It was recorded a total of ten (10) times in the wider area, mainly in bushy and wooded places.

65. *Parus major* (Kalogeros – Tsagaroudi)

Protection mode: SPEC 4

Red Book: **NE**

Presence status: Epidemic species

Ecology: Abundant everywhere, in all types of forests but also in settlements, adapted to human presence, nests in any available space with a narrow entrance. Food insects, seeds, fruits.

Threats - risks: Habitat degradation, shrub densification and sparse forest afforestation.

Population estimate : recorded in bordering forest lands and in artificial acacia plantations in the FRA area. Recorded throughout the year.

66. *Cyanistes caeruleus* (Blue Parakeet):

Protection status : SPEC 4 Red book : NE

Status of presence : epidemic species.

Ecology: abundant everywhere in mainly deciduous or mixed forests. In the study area in oak forests, it nests in natural holes or artificial nests.

Threats - risks : it is not known if it is at risk from specific causes

Population estimate : recorded in bordering forest lands and in artificial acacia plantations in the FRA area.

67. *Parus palustris* (Brown Parakeet):

Protection status : SPEC 3 Red book : NE

Status of presence : epidemic species.

Ecology : abundant everywhere in mainly deciduous or mixed forests. In the study area in oak forests, it nests in natural holes or artificial nests.

Threats - risks : it is not known if it is at risk from specific causes

Population estimation : it was recorded in a small number of observations on trees and bushes around the perimeter of the fields.

68. *Poecile lugubris* (Kleidonas):

Protection status : SPEC 4 Red book : NE

Status of presence : epidemic species.

Ecology : abundant everywhere in mainly deciduous or mixed forests. In the study area in oak forests, it nests in natural holes or artificial nests.

Threats - risks : it is not known if it is at risk from specific causes

Population estimate : recorded in a small number of observations mainly in wooded and bushy places in the FRA area.

69. *Lanius collurio* (Eagler) :

Protection regime : Annex I, JMD E.P.37338/1807/ E103 SPEC 3 Red book: NE

Status of presence : species Migratory, summer visitor

Ecology : common during autumn migration, prefers grassland and scrubland, feeds on insects

Threats - risks : it is not known if it is at risk from specific causes

Population estimate : recorded many times mainly singles on perches and flights in the project area and in the wider area. A significant presence of the species in the area and continuous activity in the cultivated lands at the sites of the projects is estimated.

70. *Lanius senator* (Redhead):

Protection status : SPEC 2 Red book : NE

Status of presence : species Migratory, summer visitor.

Ecology : common in open areas with crops, scrub and pastures, feeds on insects, stores scraps by pinning on thorns of bushes.

Threats - risks : it is not known if it is at risk from specific causes.

Population estimate : recorded several times at perch sites and flights near the works.

71. *Lanius minor* (Head Ash):

Protection regime : Annex I, JMD E.P.37338/1807/ E103 SPEC 2 Red Book : N T

Status of presence : species Migratory, summer visitor.

Ecology : nests almost exclusively in trees, usually forming small groups of 2 - 10 pairs, feeds almost exclusively on insects (mainly beetles and grasshoppers), using lookouts 1 - 6 m high. Use in open warm areas with scattered low bushes and few trees, meadows, arable land, vineyards, barren lands

Threats - risks : The main threats to the species are related to the degradation / loss of its critical habitats. Thus, agricultural intensification reinforces monocultures, destroying the mosaic of crops and tree stands. Also, extensive use of pesticides and fertilizers reduces insect populations.

Population estimate : recorded a total of 10 times in perch positions and flights near the fields, throughout the project area.

72. *Garrulus glandarius* (Magpie) :

Protection regime : - SPEC 4 Red book : NE

Status of presence : epidemic species

Ecology : its habitat is oak and beech forests, omnivorous, nests on trees

Threats - risks : it is not known if it is at risk from specific causes, it shows increasing trends in recent years

Population estimate : several individuals were recorded mainly in the woody and bushy places between the crops and in wooded fields.

73. *Corvus corone* (Cinderella) :

Protection regime : - SPEC 4 Red book : NE

Status of presence : epidemic species.

Ecology : common everywhere in abundance with increasing trends in recent years.

Threats - risks : it is not known if it is at risk from specific causes, it shows increasing trends in recent years.

Population assessment : Continuous presence of the species in the project area.

74. *Corvus monedula* (Corvus) :

Protection status : SPEC 4 Red book : NE

Status of presence : epidemic species.

Ecology : it lives in deciduous forests, breeds near humans in house holes, on bridges, social, forages in groups, omnivores, nests in tree trunks, chimneys, rock crevices.

Threats - risks : it is not known if it is at risk from specific causes.

Population estimation : recorded several times in the project area in groups of 5-12 individuals and in pairs. Their presence is constant throughout the year with their main activity in settlements and rural areas.

75. *Corvus corax* (Crow):

Protection regime : - SPEC 4 Red book : NE

Status of presence : epidemic.

Ecology : occurs in mountains and coastal cliffs, also in open forests, nests on inaccessible cliff ledges, wanders long distances, omnivorous, also feeds on carrion, birds, eggs, small mammals, worms, insects, fruits and nuts.

Threats - risks : it is not known if it is at risk from specific causes.

Population estimate : A number of single and pair flights were recorded. The species shows very good adaptation to human constructions and no significant impacts are expected from the operation of the wind farm.

76. *Sturnus vulgaris* (Sturnus vulgaris) :

Protection status : - SPEC 4 Red book : NE Status of presence : winters in the area.

Ecology : Lives close to humans in rural and urban areas. It nests in trees.

Threats - risks : it is not known if it is at risk from specific causes.

Population estimate : Recorded in flight, foraging and roosting in the project area in several recordings.

77. *Fringilla coelebs* (Finch) :

Protection regime : - SPEC 4 Red book : NE

Status of presence : epidemic species

Ecology : breeds in all forest types, builds nests in tree forks, forages on the ground

Threats - risks : Illegal capture and use of pesticides. It shows increasing trends in recent years

Population estimate : nests in the area in bushes and small trees recorded in numerous records in significant numbers.

78. *Carduelis cannabina* (Phanetto):

Protection status : SPEC 2 Red book : NE

Status of presence : epidemic species.

Ecology : breeds in open wooded areas, nests in trees.

Threats - risks : Illegal capture and use of pesticides.

Population estimate : recorded several times in the wider area.

79. *Carduelis carduelis* (Goldfinch):

Protection regime : - SPEC 4 Red book : NE

Status of presence : epidemic species.

Ecology : breeds in open wooded areas, nests in trees.

Threats - risks : it is not known if it is at risk from specific causes.

Population estimation : it was recorded multiple times in flocks and single individuals in the project area.

80. *Chloris chloris* (Florus):

Protection regime : SPEC 4 Red Book : NE

Status of presence : epidemic species.

Ecology : breeds in open wooded areas, nests in trees.

Threats - risks : it is not known if it is at risk from specific causes.

Population estimate : Recorded in a significant number of observations on trees and shrubs.

81. *Emberiza melanocephala* (Vinegrower) :

Protection regime : SPEC 2 Red Book : NE

Status of presence: species Migratory, summer visitor.

Ecology: breeds in open dry areas, with shrubs and agricultural crops

Threats - risks : it is not known if it is at risk from specific causes.

Population estimate : Recorded in a significant number of measurements in the wider area.

82. *Emberiza cirlus* :

Protection status : SPEC 2 Red book : NE

Status of presence : epidemic species

Ecology : prefers plains and hilly areas,

Threats - risks : Illegal capture and use of pesticides.

Population estimate : recorded several times in single individuals and groups of 3-5 individuals in the wider area.

IUCN Red Book species and parts Red List

RISK CATEGORY	SYMBOLISM
Missing	EX
Critically Endangered	CR
Endangered	EN
It eats	VU
Near Threatened	NT
Diminished Interest	LC
Not enough known	DD
Out of the Red Book	NE

Table 2-11: Categorization of Protective Care items in Europe SPEC

Protective Care Species Category in Europe Species of European Conservation Concern SPEC	
degree	**DESCRIPTION**
SPEC 1	Species of global concern occurring in Europe
SPEC 2	Species whose global population is found in Europe and which are under unfavorable conservation status
SPEC 3	Species whose world population is not only in Europe, but which are in an unfavorable situation in Europe
SPEC 4	Species whose global population is in Europe, but which are under favorable status in it

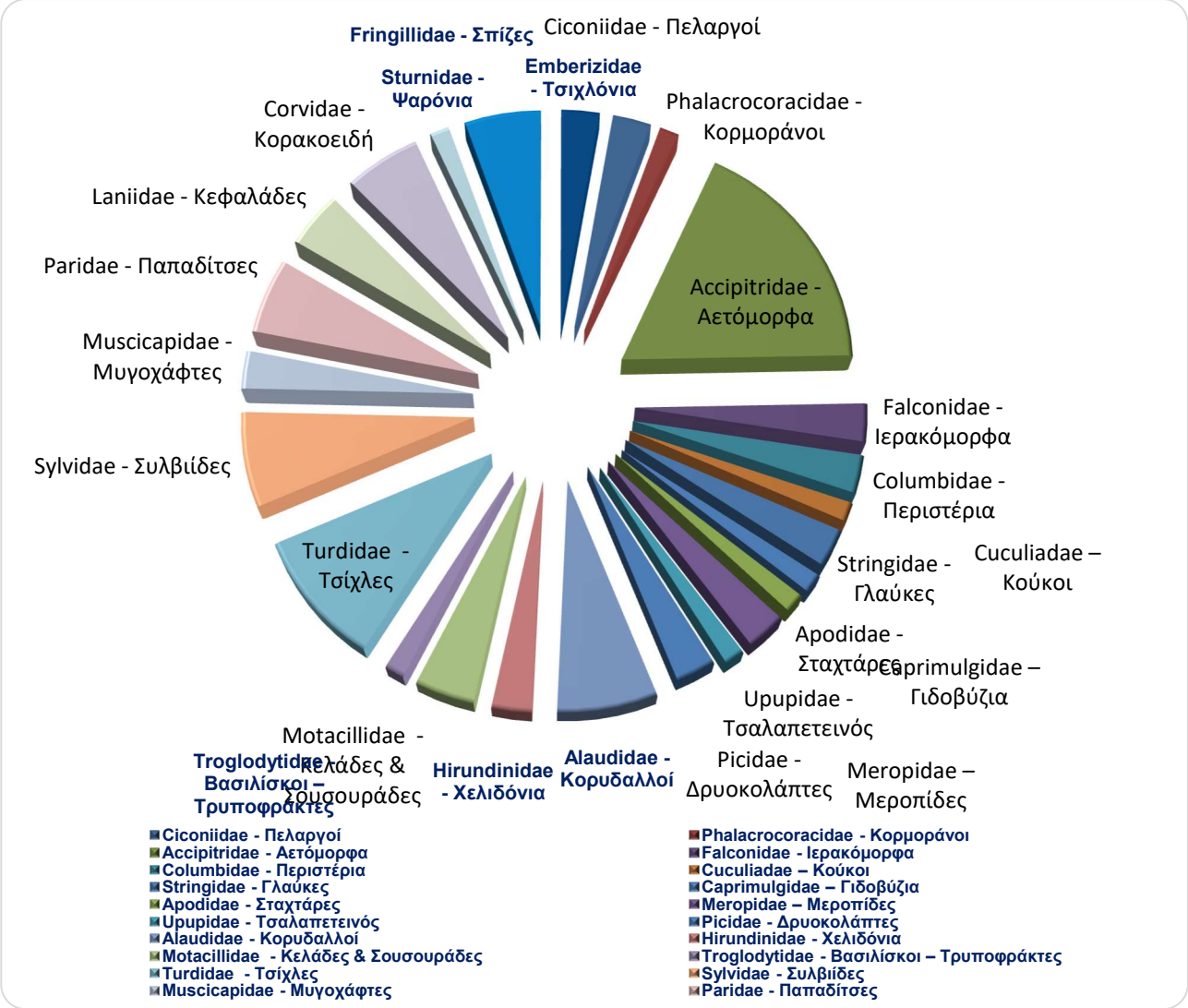

Diagram 2.2: Percentage of appearance or not in the Greek Red Book

The following table 2-12 lists in detail the species of avifauna in the area of the Wind Farm at the location "Aetokorfi" which were collected in the FRA of the project under consideration during fieldwork of 25 days within a year and also in the wider area within the framework study of a neighboring project.

Table 2-12: The species of avifauna that were recorded in the FRA

N/A	Scientific name	Common (Greek) Name	Presence status	Red Book of Birds of Greece	JMD E.P. 37338/1807/ E103	SPEC
Ciconiidae - Storks						
1	*Ciconia nigra*	Black Stork	μΦ3/M3/X4	**EN**	I	2
2	*Ciconia ciconia*	Common Stork	MF2	**VU**	I	2
Phalacrocoracidae - Cormorants						
3	*Microcarbo pygmeus*	Langona	EF3	**LC**	I	1
Accipitridae - Aetomorphs						
4	*Gyps fulvus*	Vulture	eΦ3/Φ4	**VU**	I	4
5	*Aegypius monachus*	Black vulture	eΦ4	**EN**	I	1
6	*Aquila chrysaetos*	Golden eagle	εΦ3	**EN**	I	3
7	*Clanga pomarina*	Screeching eagle	M	**EN**	I	2
8	*Circaetus gallicus*	Serpent eagle	μΦ2/M2/X4	**NT**	I	3
9	*Aquila pennata (Hieraaetus pennatus)*	Falcon	eΦ3/M2/X4	**EN**	I	3
10	*Milvus migrans*	Tsiftis	ε+μΦ3/ξ3/M2-[M2]	**CR**	I	3
11	*Circus aeruginosus*	Kalamokirkos	e+mf3/X1/M1	**VU**	I	4
12	*Circus cyaneus*	Chimonokirikos	X2/M2	**NE**	I	3
13	*Buteo buteo*	Gerakina	εΦ2/X1/M1	**NE**	-	4
14	*Pernis apivorus*	Sfikiaris	μΦ3/M2	**LC**	I	4
15	*Accipiter nisus*	Ksefteri	eΦ2/X2/M2	**NE**	-	4
16	*Accipiter brevipes*	Saini	μΦ2/M3-[t]	**NE**	I	2
Falconidae - Hieracomorpha						

17	*Falco tinunculus*	Brachokirkinezos	εΦ1/M2	**NE**	-	3
18	*Falco peregrinus*	Petritis	εΦ2/X2	**LC**	I	4
19	*Falco columbarius*	Nanogerako	X3/M4	**NE**	I	
20	*Falco subbuteo*	Dentrogerako	μΦ3/M3-[M2/Φ4]	**NE**	-	4
Columbidae - Pigeons						
21	*Columba palumbus*	Fassa	εΦ3/X2-[εΦ/X2]	NE	-	4
22	*Streptopelia turtur*	Trigoni	MF2	NE	II/2	3
Cuculiadae – Cuckoos						
23	*Cuculus canorus*	(European) Cuckoo	μΦ2/M2-[M2/Φ4]	NO	-	4
Stringidae - Glauces						
24	*Strix aluco*	Hoohooristis	EF	NE	-	4
25	*Bubo bubo*	Bufos	εΦ1	**LC**	I	3
26	*Otus scops*	Gionis	e+MF1	NE	-	2
***Caprimulgidae* – Goats**						
27	*Caprimulgus europaeus*	Gidovizi	μΦ2/M3-[μΦ2/M2]	LC	I	2
Apodidae - Stachtares						
28	*Apus apus*	Stachtara	MF	NO	-	4
Meropidae – Meropides						
29	*Merops apiaster*	(European) Bee-eater	μΦ3/M2-[μΦ3/M1]	NE	-	3
30	*Coracias garrulus*	Chalkokourouna	MF3	NE	I	2
Upupidae - Upupidae						
31	*Upupa epops*	Tsalapeteinos	εΦ2/M2	**NE**	-	3
Picidae - Woodpeckers						

32	*Picus viridis*	Green Woodpecker	εΦ2	NE	-	**2**
33	*Dendrocopos medius*	Medium Woodpecker	εΦ2	**LC**	I	-
34	*Dryocopus martius*	Black Woodpecker	εΦ3	**LC**	I	-
35	*Dendrocopos syriacus*	Balkan Woodpecker	εΦ2	**NE**	I	4
Alaudidae - Swallows						
36	*Alauda arvensis*	Starithra	EF3	NT	-	3
37	*Galerida cristata*	Katsoulieris	EF1	NE	-	3
38	*Calandrella brachydactyla*	Microgalliandra	μΦ3/M2-[μΦ4/M2]	NE	I	3
39	*Melanocorypha calandra*	Galiandra	EF3	**VU**	I	3
40	*Lullula arborea*	Dentrostarithra	εΦ1/X2	**LC**	I	2
Hirundinidae - Swallows						
41	*Hirundo rustica*	Barn swallow	μΦ1/M1	**NE**	-	3
42	*Delichon urbicum*	House swallow	MF	NE	-	3
Motacillidae - Weevils & Whispers						
43	*Motacilla cinerea*	Stachtosousoyrada	μΦ3/Φ2/M3-[Φ2/M3/Φ4]	NE	-	4
44	*Motacilla alba*	Lefkosousourada	EF2	NE	-	4
45	*Anthus campestris*	Ochrokelada	μΦ3/M2	**LC**	I	3
46	*Anthus pratensis*	Livadokelada	X1	NE	-	4
Troglodytidae - Basilisks - Thrips						
47	*Troglodytes troglodytes*	(European) Tripofrachtis	εΦ2/X2-[εΦ2]	NE	-	4
Turdidae - Thrushes						
48	*Erithacus rubecula*	Robin	εΦ2/X1/M2-[X1/M3]	NE	-	4
49	*Phoenicurus ochruros*	Carvouniaris	εΦ2/X1/M2-[X2/M2]	NE	-	4
50	*Phoenicurus phoenicurus*	(Common) Finikouros	μΦ3/M2-[M1]	NE	-	2
51	*Saxicola rubetra*	Kastanolemis	εΦ3/M1-[M1]	NE	-	4
52	*Saxicola rubicola*	(European) Mavrolemis	εΦ2/X2/M3-[X1/M3]	NE	-	4

53	*Oenanthe oenanthe*	Stachtopetroklis	μΦ2/M1-[M1]	NE	-	3
54	*Turdus pilaris*	Kedrotsichla	eΦ4	**NO**	II/2	4
55	*Turdus philomelos*	Tsichla	εΦ3	**NO**	II/2	4
56	*Turdus merula*	Kotsifas	εΦ1/X1	**NE**	II/2	4
Sylvidae - Sylviides						
57	*Iduna pallida*	Ochrostrichtsida	μΦ1/M2-[μΦ1/M4]	NO	-	-
58	*Hippolais olivetorum*	Liostritsida	MF3/M4	NT	I	4
59	*Sylvia communis*	Thamnochirovakos	MF2	NE	-	4
60	*Sylvia melanocephala*	Mavrochirovakos	MF	NE	-	4
61	*Phylloscopus trochilus*	Thamnofylloskopos	M1	**NE**	-	4
62	*Phylloscopus collybita*	Dentrofylloskopos	eΦ3/X1/M2	**NE**	-	4
Muscicapidae - Flycatchers						
63	*Muscicapa striata*	Stachtomigochaftis	μΦ2/M1	**NE**	-	3
64	*Ficedula semitorquata*	Driomigochaftis	μΦ3/M3	**DD**	I	2
Paridae - Parakeets						
65	*Parus major*	Kalogeros	εΦ1/X2	**NE**	-	4
66	*Cyanistes (Parus) caeruleus*	Galazopapaditsa	εΦ1	**NE**	-	4
67	*Poecile (Parus) palustris*	Kastanopapaditsa	εΦ3	**NO**	-	3
68	*Poecile lugubris*	Klidonas	εΦ2	**NO**	-	-
Laniidae - Cephalidae						
69	*Lanius collurio*	Aetomahos	μΦ2/M1	**NE**	I	3
70	*Lanius senator*	Kokkinokefalas	MF2/M2	**NE**	-	2
71	*Lanius minor*	Stahtokefalas	MF3/M3	**NT**	I	2
Corvidae - Corvids						
72	*Garrulus glandarius*	Kissa	εΦ1	**NE**	II/2	4

73	*Corvus corone*	Stahtokourouna	εΦ1	**NE**	II/2	4
74	*Corvus monendula*	Kargia	EF1	**NE**	II/2	4
75	*Corvus corax*	Korakas	εΦ2	**NE**	-	4
Sturnidae - Kingfishers						
76	*Sturnus vulgaris*	Psaroni	EF3/X1	**NE**	-	3
Fringillidae – Fringillidae						
77	*Fringilla coelebs*	Spinos	eΦ1/X1/M3	**NE**	-	4
78	*Carduelis (Linaria) cannabina*	Faneto	eΦ2/X2/M4	**NE**	-	2
79	*Carduelis carduelis*	Karderina	eΦ1/X2/M4	**NE**	-	4
80	*Chloris chloris*	Floros	eΦ1/X2/M4	**NE**	-	4
Emberizidae - Cichlonia						
81	*Emberiza melanocephala*	Ampelourgos	MF2	**NE**	-	2
82	*Emberiza cirlus*	Shirlocichlono	εΦ2	**NE**	-	4

Below are some of the recordings made in the wider area in a corresponding study, for a related project, as well as the registered flight recording of the *Pelecanus species crispus* as reflected in the Movebank.org

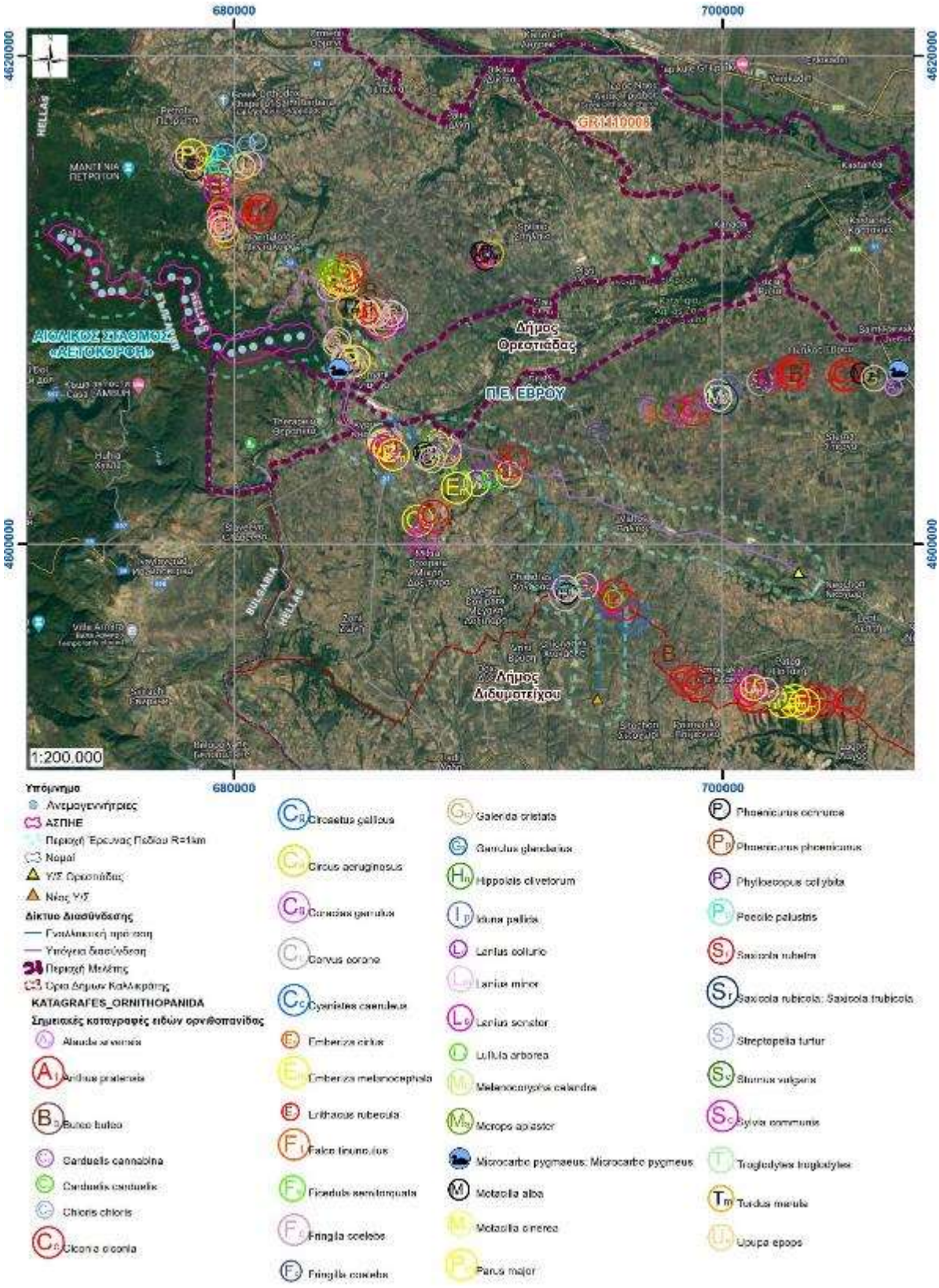

Figure 2-8: Records of bird species with data from 2022, in the wider area of Trigono

Figure 2-9 : Data of telemetry recordings using GPS transmitters for the Silver Pelican (SOURCE: LIFE VULTURE https://life-vultures.rewildingeurope.com/) for the year 2022

2.1.6. Description of Bird Habitats in the FRA

The ecological value of an area as a special habitat depends on its degree of organization, extent, structure, ecological status and the existence in it of rare plant and animal species. The evaluation of the habitats of the study area concerning the Wind Farm, along with the cable connecting the S/S with the "Aetokorfi" project, is made with the Ornithological value as a basic criterion, and in particular its value as a habitat for strictly protected species of birds included in Annex I of JMD E.P. 37338/1807/ E103 (Government Gazette 1495B/6-9-2010). Secondly, it is evaluated based on more general ecological criteria, such as the rarity of plant composition, morphological peculiarities, naturalness and their scientific interest.

The dominant habitat in the area of the Wind Farm under study is the evergreen forests with grassland gaps. The wider area is dominated by crops and scattered bushes and maquis and water systems with riparian vegetation.

Mixed Oak and Other Broadleaf Forests

The wind farm, the wind turbines and part of the grid connection of the project under study are located within forested areas of oak and other deciduous broad-leaved species. The plant species found in the habitat are mainly the oak (*Quercus robur*), the poplar (*Populus alba*), the elm (*Ulmus minor*), the dogwood (*Cornus sanguinea),* the walnut (*Juglans regia),* the garb (*Carpinus orientalis*), the maple (*Acer sp* .), the frax (*Fraxinus angustifolia*), the Sorbus (*Sorbus torminalis*) and the oyster (*Ostrya carpinifolia*).

The characteristic habitat of mixed oak and other broadleaf forests is 91M0. The bird species that use the specific habitat in the study area of the Wind Farm under consideration are the following:

Clanga pomarin a , Accipiter nisus, Erithacus rubecula, Dendrocopos major, Dendrocopos syriacus, Turdus merula, Parus major, Poecile palustris, Garrulus glandarius, Corvus corone, Corvus corax, Fringilla coelebs, Phoenicurus ochruros, Phoenicurus phoenicurus, Sylvia atricapilla, Sylvia nisoria, Muscicapa striata, Cyanistes caeruleus, Pernis apivorus, Lanius collurio, Hippolais olivetorum, Oriolus oriolus, Fringilla coelebs, Emberiza caesia, Phylloscopus trochilus, Phylloscopus collybita, Ficedula albicollis, F. parva.

Crops

The typical landscape in the wider area around the settlements is agricultural crops. Agricultural crops include areas cultivated with grain, tobacco and fruit and fallows in fallow areas. Grassland, barren and cultivated lands host a significant number of arthropods and invertebrates (worms, snails, etc.), reptiles and micromammals, which are the prey of many species of avifauna and therefore attract several species and are a foraging habitat for a significant number of species. The characteristic habitat of the cultivated - agricultural lands is 1020. The species of avifauna that were recorded and based on their habitat and ecology use the specific habitat are the following:

Circaetus gallicus, Aquila pomarina, Buteo buteo, Pernis apivorus, Circus cyaneus, Accipiter nisus, Falco tinunculus, Ciconia Ciconia, Lullula arborea, Alauda arvensis, Motacilla cinerea, Erithacus rubecula, Turdus merula, Parus major, Garrulus glandarius, Corvus corone, Corvus corax , Upupa epops, Carduelis carduelis, Carduelis cannabina, Hirundo rustica, Delichon urbicum, Fringilla coelebs, Apus apus, Merops apiaster, Galerida cristata, Muscicapa striata, Calandrella brachydactyla, Mellanocorypha calandra, Lanius collurio, Lanius nubicus, Emberiza calandra

Shrubs

These forested areas in the study area cover the area that includes local hills and streams between the cultivated areas. The species that grow include shrubs of the holly species (*Quercus coccifera*), aria (*Quercus ilex*), gorse (*Pyrus amygdaliformis*), wild almond (*Pyrus pyraster*), wild rose (*Rosa canina*), gabbro (*Carpinus orientalis*), Ligaria (*Vitex agnus castus*). The characteristic habitat with the transitional property and the spatial dominance of broad-leaved shrubs is 934A.

The bird species that were recorded and based on their habitat and ecology use the specific habitat are the following:

Circaetus gallicus, Aquila pomarina, Buteo buteo, Pernis apivorus, Accipiter nisus, Falco tinunculus, Lullula arborea, Erithacus rubecula, Galerida cristata , *Lanius collurio, Lanius nubicus* , *Phoenicurus ochruros, Turdus merula, Parus major, Garrulus glandarius, Corvus corone, Corvus corax , Upupa epops, Carduelis carduelis, Carduelis cannabina, Hirundo rustica, Delichon urbicum, Fringilla coelebs, Calandrella brachydactyla, Mellanocorypha calandra, Apus apus, Merops apiaster, Muscicapa striata*

Riparian forests

These forests are located along the river Evros and the tributary of Ardas and are forests and groves dominated by willow, poplar and plane trees. In some places the Mediterranean pine is also found. More specifically, the species of flora that grow in these watery habitats consists of *Salix* spp *., Alnus glutinosa , Platanus orientalis , Smilax aspera , Hedera helix , Celtis australis , Fraxinus angustifolia, Juglans regia , Pinus brutia , Clematis vitalba , Nerium oleander , Equisetum arvense , Carex pendula, Rubus sanctus , Symphytum bulbosum , Agrostis* sp .

The bird species that use the riparian forest habitats of the study area are the following:

Calidris pugnax , Clanga pomarina , Clanga clanga , , Falco columbarium , Ficedula semitorquata , Fulica atra , Milvus milvus , Buteo buteo , Nycticorax nycticorax , Oriolus oriolus , Tringa ochropus , Zapornia parva , Emberiza caesia , Fringilla coelebs, Muscicapa striata, Alcedo atthis

Water streams and lakes

In the area study, small water streams are found, but also a number of small in-river reservoirs - water streams that were built for the purpose of irrigating crops. The places in the streams and especially the small lakes of the reservoirs are an ideal habitat for nesting species, while in the small lakes stahtares and swallows gather. The species that use these areas are the following:

Cyanecula svecia , Gallinago gallinago , Circus cyaneus , Nycticorax nycticorax , Phalacrocorax pygmeus , Porzana Porzana , Falco columbarius , Tringa ochropus , Zapornia parva , Motacilla flava, Emberiza caesia , Himantopus Himantopus , Spatula clypeata , Anas crecca , Alcedo atthis , Anas

platyrhynchos , Anser albifrons albifrons , Ardea cinerea , Calidris alpina , C. minuta , C. Pugnax , C. Temminckii , Charadrius hiaticula , Erithacus rubecula , Turdus merula , Sylvia atricapilla , Cyanistes caeruleus

2.2. RECORDING THE STATE OF THE NATURAL ENVIRONMENT IN THE AREA OF THE NATURA 2000 NETWORK – GR 1110008 "NORTH EVROS RIVER FOREST AND ARDAS"

Chapter 1.3 presents the main conclusions regarding the state of the natural environment in the study area, according to the analysis and evaluation of the results of the available information from the Standardized Data Forms, the research programs that have been prepared in the study area and the 3rd Implementation Report. It was emphasized that the conclusions regarding the state of the natural environment took into account the following:

The ecological requirements of the species and types of habitats for which the relevant Natura 2000 areas have been designated.

The conservation status of the above species and types of habitats at local and national level.

The pressures and threats and risks of degradation, destruction or disturbance of the above species.

2.2.1. Conservation objectives of the area GR 1110008 – Riparian Forest of Northern Evros and Ardas

For the study area (GR 1110008 Riparian Forest of Northern Evros and Arda) no conservation objectives have been set and according to the guidelines of the Official Journal of the European Union (C 33, 25.1.2019): In the cases where **no conservation objectives have been set** for a site, and until they are defined, due consideration must take as a minimum the assumption that the objective is to ensure that the habitat types or habitats of the species occurring at the site are not degraded below the existing level or that the species are not significantly disturbed , in accordance with the requirements of Article 6 paragraph 2 and without prejudice to the effectiveness of the conservation measures required to fulfill the requirements of Article 6 paragraph 1. In accordance with the requirements of Article 6 paragraph 2 of the guidelines of the European Commission Brussels, (C 2018 – 7621, 21.11.2018): Disturbances affecting a species occur in a place due to events, activities or processes that contribute, within the place, to the long-term decline of the population of the species, the decline or the risk of decline in the area of its natural distribution and in reducing the extent of its available habitat. This assessment is carried out in accordance with the conservation objectives of the site and its contribution to the cohesion of the network.

The **Conservation Objectives** for SPAs are outlined in Greek Law 1289/B/28-12-98 (transposition of the Habitats Directive) and Greek Law 68/B/4-2-98 (transposition of the Birds Directive). The

stated primary conservation objective of Natura 2000 sites is "the conservation and management of nature and landscape as natural heritage and a valuable national natural resource". Includes:

• The protection and preservation of the natural characteristics of the protected habitats,

• The protection and preservation of the protected flora and fauna of the area,

• The preservation of forest areas as valuable predator habitats,

• Development compatible with the above activities to preserve and ensure traditional technical uses of land and the compatible development of ecotourism with sustainable development and,

• The maintenance of nesting areas of protected predatory species.

SPA GR1110008 has been designated in accordance with the criteria set out in the Birds Directive, for the following species that have a large population in its area: the grebe (*Lanius minor*), the grebe (*Dendrocopos syriacus*), the night raven (*Nycticorax nycticorax*) and the langon (*Phalacrocorax pygmeus*).

The purpose of the forestry of the Riparian Forest of Northern Evros and Ardas is to respect and protect the landscapes, to preserve the environmental conditions in which the populations of aquatic and predatory birds will survive and develop, and finally to preserve biodiversity. **Conservation of biodiversity** means the preservation and protection of the following:

• The mosaic of biotopes throughout the area

• Biotopes of local importance, such as stands with aquatic vegetation in the beds of rivers and streams, mature forests with clearings or meadows, hedgerow fields and small wetlands

• Species and populations of predatory and aquatic migratory birds

• The large number of rare species of fauna and their habitats

• The large number of endemic plants

2.2.2. Conservation status of habitats - Flora & Fauna species of the Protected Area GR 1110008

Habitat conservation status within FRA

In compliance with the provisions of Directive 92/43/EEC of the Council of May 21, 1992 of the European Communities and Directive 97/62/EEC of the Council of October 27, 1997 of the European Communities "for the technical and scientific adaptation of Directive 92/43 /EEC ... etc" (EEL 305/8.11.97 p. 49) we had JMD 33318/3028/1998 "Definition of measures and procedures for the conservation of natural habitats (habitats) as well as wild fauna and flora" (Government Gazette

1289/28-12- 1998, vol. B'). The EU Directive, therefore, became the internal law of our country determining the participation in the European Ecological Network of Special Conservation Areas "Natura 2000" which aims to protect biological diversity by taking the necessary and appropriate measures to ensure the preservation or restoration to a satisfactory degree of conservation of natural habitats (habitats) and wild species of flora and fauna of community interest.

For most habitats at the national level, the aim is to maintain a constant area and range of habitat types at the national level or to increase them and not decrease them (extent, range) to a lower limit, respectively, than the Satisfactory Area and the Satisfactory Reference Range .

3280 : Habitat type in 1st conservation priority. Type of habitat that constitutes or could serve as an intermediate / connecting link (stepping stone) for maintaining the coherence of the Natura 2000 network. Habitat conservation objectives **3280** at national level:

- To improve and/or upgrade the current state of structures and functions (including standard items) to tend to a Satisfactory Level of Conservation (FV).
- Also to change the type and intensity of pressures and threats from: • medium to high with medium or large impact/impact, • to low to medium intensity with small to medium impact/impact, and therefore contributing to the upgrading of future perspectives of habitat type structure and functions from Poor-P to Good-G

91M0 : Habitat type in 2nd conservation priority. The spatial distribution pattern is determined by extensive clusters of a common or widespread habitat type in the easternmost part of Greece, while the distribution of the habitat type in Greece coincides with the center of its European distribution. Habitat conservation objectives **91M0** at national level:

- To keep the extent and range of the habitat type constant at the national level and not to make significant changes in its distribution pattern within the distribution range, and not to become smaller (extent and range) than the Satisfactory Area and the Satisfactory Reference Range.
- To keep the extent and range of the habitat type constant at the national level and not to make significant changes in its distribution pattern within the distribution range, and not to become smaller (extent and range) than the Satisfactory Area and the Satisfactory Reference Range.
- Preservation of specific structures and functions (and typical species) at a Fair Level of Preservation (FV)

- Keeping applied pressures and threats at low intensity with little or moderate effect/impact, thereby contributing to the maintenance of the Good-G future prospects of the structure and functions of the habitat type.

92A0 : Habitat type in 1st conservation priority. Habitat type that occurs in Greece in extreme positions in relation to its European pattern of distribution (marginal habitats), rare habitat type. Type of habitat whose spread in Greece coincides with the center of its European spread, which constitutes or could serve as an intermediate / connecting link (stepping stone) to maintain the coherence of the Natura 2000 network. Important and rare habitat type. Habitat conservation objectives **92A0** at national level:

- To improve and/or upgrade the current state of structures and functions (including standard items) to tend to a Satisfactory Level of Conservation (FV).
- Also to change the type and intensity of pressures and threats from: • medium to high with medium or large impact/impact, • to low to medium intensity with small to medium impact/impact, and therefore contributing to the upgrading of future perspectives of habitat type structure and functions from Poor-P to Good-G

92C0 : Habitat type in 2nd conservation priority. The spatial pattern of its spread at National level is determined by extensive clusters of an otherwise common or widespread habitat type (within and outside the Natura 2000 network). Its spread in Greece coincides with the center of its European spread, which constitutes or could serve as an intermediate/connecting link (stepping stone) for maintaining the coherence of the Natura 2000 network. Habitat conservation objectives **92C0** at the national level:

- To keep the extent and range of the habitat type constant at the national level and not to make significant changes in its distribution pattern within the distribution range, and not to become smaller (extent and range) than the Satisfactory Area and the Satisfactory Reference Range.
- To keep the extent and range of the habitat type constant at the national level and not to make significant changes in its distribution pattern within the distribution range, and not to become smaller (extent and range) than the Satisfactory Area and the Satisfactory Reference Range.
- Preservation of specific structures and functions (and typical species) at a Fair Level of Preservation (FV)
- Keeping applied pressures and threats at low intensity with little or moderate effect/impact, thereby contributing to the maintenance of the Good-G future prospects of the structure and functions of the habitat type.

934A : Habitat type in 2nd conservation priority . The spatial pattern of its spread at National level is determined by extensive clusters of an otherwise common or widespread habitat type (within and outside the Natura 2000 network). Its spread in Greece coincides with the center of its European spread, which is or could serve as an intermediate/connecting link (stepping stone) for maintaining the coherence of the Natura 2000 network. Habitat conservation objectives **934A** at the national level:

- To keep the extent and range of the habitat type constant at the national level and not to make significant changes in its distribution pattern within the distribution range, and not to become smaller (extent and range) than the Satisfactory Area and the Satisfactory Reference Range.

Table 2-13 shows the results of the conservation status of the habitat types in the FRA of the project under study, based on the data analysis process described in the previous chapter.

Table 2-13. Conservation status of habitat types within the FRA

NAME	CODE	REPRESENTATIVENESS	RELATIVE SURFACE	DEGREE OF PRESERVATION	TOTAL EVALUATION
Mediterranean rivers with a permanent flow of Paspalo – Agrostidion and dense canopy vegetation of Salix and Populus alba along their banks	3280	C	C	C	C
Pannonian oak forests with Quercus cerris and/or Quercus petraea.	91M0	A	A	A	A
Forests – galleries with Salix alba and Populus alba	92A0	B	C	B	B
Platanus orientalis and / or Liquidambar orientalis forests	92C0	B	C	B	B
Greek Forests of Prinos	934A	A	A	A	A

Representativeness : A: excellent representativeness, B: good representativeness, C: sufficient representativeness.
Relative surface : A: 100 ≥ p > 15 % , B: 15 ≥ p > 2 % , C: 2 ≥ p > 0 %
Grade of Preservation : A: excellent preservation, B: good preservation, C: moderate or limited preservation.
Overall Rating : A: excellent value, B: good value, C: adequate value.

According to the data in Table 1-19, the following conclusions are drawn regarding the conservation status of the habitat types (H.T.) in the FRA:

The habitats present in the FRA are characterized by moderate to good representativeness and the surface they cover is important at the level of the project area.

Conservation status of Flora species within FRA

Regarding the species of flora within the FRA of the project under study, no species of flora included in Appendix II of the JMD E.P.14849/853/E103/4.4.2008 is found. According to the bulletins of the areas of the NATURA 2000 network, no significant pressures and threats are recorded for the flora species of the area.

Conservation status of Fauna species within FRA

Bats are estimated to be active in the Field Research Area: *Myotis blythii* (Micromyotid), *Myotis myotis* (Tranomyotida), *Myotis emarginatus* (Pyrromyotid), the Mediterranean turtle (*Testudo hermanni*) which together with the previous species included in Annex II of Directive 92/43/EEC. It is also estimated that the Green lizard (*Lacerta viridis*) and the Wall lizard (*Podarcis muralis*), which belong to Annex IV of Directive 92/43/EEC, are active in the project area . Regarding the existing pressures and threats for the species within the limits of the FRA, we mention the following:

Bat species may be affected by the installation of the wind farm under study. The information on the degree of conservation of the species is not enough, nevertheless the degree of conservation for the above species is considered unsatisfactory (U1).

Testudo hermanni (Mediterranean turtle): It is estimated that the degree of conservation of the species in the area is good with a good density and not an isolated population.

***Lacerta viridis* (Green lizard), *Podarcis muralis* (Tichosaurus)** : It is estimated that the degree of conservation of the species in the area is good with good density and no isolated populations.

Table 2-14 . Evaluation of the conservation status of fauna species present within the FRA .

SCIENTIFIC NAME	TYPE	CATEGORY	population	DEGREE OF PRESERVATION	ISOLATION	TOTAL EVALUATION
Myotis blythii	p	P	B	C	C	C
Myotis myotis	p	P	B	C	C	C
Myotis emarginatus	p	P	B	C	C	C
Testudo hermanni	p	C	B	B	C	B

Type: Permanent (p): the species is present at the site throughout the year (non-migratory species or plant, resident population of a migratory species), (r): reproduction, (c) : concentration, (w) : wintering
Class: common (C), rare (R), very rare (V), or present (P)
Population (size and density of the population of the species present in the area in relation to the populations present in the national territory): A: 100 % ≥ p > 15 %, B: 15 % ≥ p > 2 %, C: 2 % ≥ p >0 %.
Degree of Preservation: A: excellent preservation, B: good preservation, C: moderate or limited preservation
Isolation: A: (almost) isolated population, B: population not isolated, but on the fringes of range, C: population not isolated within wider range
Overall Rating: A: excellent value, B: good value, C: adequate value

The assessment of the conservation status at National level of the specific species included in Annex II of Directive 92/43/EEC according to the 3rd National Implementation Report of Directive 92/43/EEC are listed in table 1-21.

Table 2-15 . Assessment of conservation status at National Level of fauna species with possible presence within the FRA according to the 3rd National Implementation Report of Directive 92/43/EEC.

NAME	SPREAD AREA	population	HABITAT	PROSPECTS	TOTAL EVALUATION	HOLD STATE VOLTAGE
Myotis blythii	XX	XX	XX	U1	U1	(x)
Myotis myotis	XX	XX	XX	U1	U1	(x)
Myotis emarginatus	XX	XX	XX	U1	U1	(x)
Testudo hermanni	FV	U1	U1	XX	U1	(-)

FV: Favorable assessment, U1: Inadequate assessment, U2: Poor assessment, XX: Unknown assessment
(+): Uptrend, (x): Unknown trend, (-): Downtrend, N/A: N/A

Conservation status of bird species

In compliance with the provisions of Council Directive 79/409/EEC of April 2, 1979, as amended by Council Directive 81/854/EEC of October 19, 1981 (OJ 319/7.11.81 p. 3) we had the JMD

414985/1985 "Measures for the management of wild birds" (Government Gazette 754/18-12-1985, vol. B') which was amended and supplemented by Decree 294283/1998 "Measures for the management of wild birds, in compliance with Directives 94/ 24 EC of the Council and 91/244/EEC, 97/49/EC of the Commission" (Government Gazette 68/4-2-19988, vol. B') according to which our country is committed to taking the necessary measures to maintain all of wild bird species. In particular for the protection, management and regulation of their populations, so that these populations respond particularly to the ecological, scientific and cultural requirements, taking into account the economic and recreational needs. This decision applies to birds, eggs, nests and their habitats.

The conservation status of bird species in the SDF form of the area GR 1110008 (Study Area), is presented in tabular form in a previous chapter.

2.2.3. Current Reference Prices

For the Area GR 1110008 – Riparian Forest of Northern Evros and Ardas, the reference values given for the bird species are as follows:

Table 2-16. Reference values (RV) for protected bird species, SPA GR 1110008 – Riparian Forest of Northern Evros and Ardas

GR 111000 8					
SPECIES	**KIND**	**ANNEX**	**POPULATION RV**	**UNITS**	**RANGE RV (km ^{2})**
Accipiter brevipes - Saini	B	I	20.00	i	235.10
Acrocephalus melanopogon	B	I	2.00	i	7.44-
Aegolius funereus	B	I	2.00	i	
Alauda arvensis (Wheatgrass)	B	II/2			30.00
Anas clypeata	B	II/1; III/2			259.31
Anas crecca crecca (Peacock)	B	II/1; III/2			259.31
Anas penelope (Whistle)	B	II/1; III/2			259.31
Anas querquedula (Sarcella)	B	II/1			259.00
Anser albifrons albifrons (White-fronted goose)	B	II/2; III/2			259.31
Anthus campestris (Chamokelada)	B	I			164.48
Apus (Tachymarptis) melba (Skeparnas)	B				259.31
Apus apus (Cinderella)	B				259.31
Aquila clanga (spotted eagle)	B	I			259.31
Aquila heliaca (Golden Eagle)	B	I			259.31
Aquila pomarina	B	I	2.00	i	259.31

Ardea cinerea cinerea (Cinderella)	B		80.00	i	259.31
Ardea purpurea purpurea (Purple heron)	B	I			259.00
Ardeola ralloides ralloides (Ardeola ralloides)	B	I			259.00
Botaurus stellaris stellaris (Taurus)	B	I			259.00
Bubo bubo (Bubo)	B	I	2.00	i	259.00
Buteo buteo (Geracina)	B		8.00	i	259.00
Buteo lagopus	B				259.00
Buteo rufinus	B	I			105.00
Calandrella brachydactyla	B	I			259.31
Calidris alpina alpina (Calidris alpina alpina)	B				259.00
Calidris minuta (Calidris minuta)	B				259.31
Calidris temminckii (Cinderella)	B				259.31
Caprimulgus europaeus (Caprimulgus europaeus)	B	I			209.00
Charadrius dubius curonicus (River Whistler)	B	I			259.31
Charadrius hiaticula (Sandwhistle)	B	I			259.00
Ciconia ciconia Ciconia (Stork)	B	I			259.00
Ciconia nigra (Black stork)	B	I			259.00
Circaetus gallicus (Snake eagle)	B	I	2.00	i	236.00
Circus aeruginosus	B	I			259.00
Circus cyaneus	B	I			259.00
Circus macrourus	B	I			250.00
Circus pygargus	B	I			250.00
Clamator glandarius	B				259.00
Columba oenas (Pigeon)	B	II/2			179.00
Columba palumbus palumbus (Pigeon)	B	II/ 1, II I / 1			259.00
Coracias garrulus (Magpie)	B	I	50.00	i	159.31
Coturnix coturnix (Quail)	B	II/2			259.31
Crex crex (Needles)	B	I			259.31
Cygnus olor (Swan)	B	II/2			207.74
Delichon urbicum (urbica)	B	I			259.31
Dendrocopos medius (Medium woodpecker)	B	I			202.00
Dendrocopos syriacus (Balkan woodpecker)	B	I			212.28
Egretta alba (Casmerodius albus albus) (Argyrotsiknias)	B	I	30.00	i	259.31

Egretta garzetta garzetta (Lefkotsiknias)	B	I			259.31
Emberiza caesia (Emberiza caesia)	B	I			152.80
Emberiza hortulana (Emberiza hortulana)	B	I			150.00
Falco columbarius	B	I			243.16
Falco eleonorae (Black petrel)	B	I			259.00
Falco naumanni (Kirkinese)	B	I	4.00		200.00200.00
Falco peregrinus brookei (Petrite)	B	I			242.31
Falco vespertinus	B	I			259.31
Ficedula albicollis (Flying Flycatcher)	B	I			179.79
Fulica atra atra (Fulica atra atra)	B	II/ 1, II I /2			259.31
Gallinago gallinago (Gallinago gallinago)	B	II/ 1, II I /2			259.31
Hieraaetus pennatus (Aquila pennata)	B	I			259.00
Himantopus himantopus (Kalamokanas)	B	I			259.31
Hippolais olivetorum (Hippolais olivetorum)	B	I			179.79
Hirundo rustica	B				259.31
Ixobrychus minutus minutus (Little Egret)	B	I			259.49
Jynx torquilla	B				212.28
Lanius collurio (Eaglebird)	B	I	11.00	i/sq.km	259.31
Lanius minor (Cinderella)	B	I			259.31
Lanius nubicus (Lanius nubicus)	B	I			259.31
Larus (Chroicocephalus) ridibundus (Brown-headed Gull)	B	I I/2			259.00
Larus canus (Storm Gull)	B	I I/2			253.49
Lullula arborea	B	I			100.00
Luscinia svecica cyanecula (Bluethroat)	B	I			259.31
Lymnocryptes minimus	B	I I/1, I II/2			150.00
Melanocorypha calandra (Calandra)	B	I			259.00
Merops apiaster (Bee-eater)	B				106.46
Milvus migrans	B	I			259.31
Milvus milvus (Psalidiaris)	B	I			30.00
Motacilla flava (Motacilla flava)	B				259.31
Neophron percnopterus	B	I			259.00
Nycticorax nycticorax nycticorax (Night Raven)	B	I	160.00	i	259.31

Oenanthe isabellina (Oenanthe isabellina)	B				170.30
Oriolus oriolus (Skyhawk)	B				212.28
Passer hispaniolensis	B				259.31
Perdix perdix (Partridge)	B	II/1, III/1			259.31
Pernis apivorus (Pernis apivorus)	B	I			259.31
Phalacrocorax carbo sinensis (Cormorant)	B				259.31
Phalacrocorax pygmeus (Lagona)	B	I			259.31
Platalea leucorodia leucorodia	B	I			259.31
Plegadis falcinellus falcinellus		I			259.31
Porzana porzana (Porzana)		I			40.00
Porzana pusilla intermedia (Porzana pusilla intermedia)		I			8.00
Riparia riparia (Riparia riparia)					200.00
Gelochelidon) nilotica nilotica		I			31.30
Streptopelia turtur (Wren)		II /2			259.31
Sylvia nisoria		I			259.31
Tachybaptus ruficollis ruficollis (Tachybaptus ruficollis)					259.31
Tringa glareola (Tringa glareola)		I			259.31
Tringa ochropus					259.31
Tringa totanus (Redshank)		II /2			160.71
Vanellus vanellus (Kalimana)		II /2			150.00

2.2.4. Main pressures and threats that exist

The main threats to the bird species of SPA GR 1110008 – Riparian Forest of Northern Evros and Ardas include:

• Abandonment of traditional agricultural practices and land uses, including abandonment of extensive agriculture and animal husbandry - CRITICAL

• Illegal use of poisoned baits – CRITICAL

•Food shortage – HIGH

•Electric shock & impact on electricity generation and transmission infrastructures – HIGH

• Breeding habitat degradation – HIGH

• Foraging habitat degradation - HIGH

• Veterinary preparations (NSAIDs) – LOW

• Disturbance at breeding sites – MEDIUM

• Illegal hunting, destruction of nests – LOW

• Trade & embalming – LOW

Food scarcity appears to be among the high-level threats, along with electrocution from power lines, breeding habitat degradation, and foraging habitat degradation. Degradation and mismanagement of forest ecosystems pushed some of the raptors to lower altitudes in search of food. The area of the wind farm installation under study is one such example. In addition, the rural area of the study project is a part of the foraging habitat of many migratory and waterfowl, but it is the main foraging habitat of endemic and migratory raptors and ostrich species of the study area.

Some more factors that threaten to reduce the populations of mainly ostriches and predators, but are also threats to waterfowl and are listed in deliverable 8 (Y.PE.HO.DE., T. Dimalexis, 2009), are the following :

• Activities that cause a disturbance (hunting, logging, fishing, collecting plants and firewood

• All leisure activities

• Drainage of wetlands and other land improvement projects

• Abandonment of traditional agricultural practices and land uses, including the abandonment of extensive farming and ranching

• Pollution from agrochemicals floblade into water receivers, flooding of receivers

• Extension - Intensification of annual crops

• Intensification of perennial crops (vineyards, orchards, olive groves, etc.)

• Intensive aquaculture

• Reforesting

• Accidental killing by hunting or poaching

• Improper forest management

• Pollution from municipal sewage

• Pollution from industrial or military activities

• Stalking by specific users as harmful

• Infectious Diseases

• Deforestation logging

• Changes in the intensity and frequency of forest fires (increase or decrease)

• Expansion-intensification of agriculture

• Intensive and barned livestock farming

• Residential development, urban or off-plan, legal or arbitrary

• Drainage of wetlands and other land improvement projects

• Anti-corrosion works, cleaning of riverbeds, streams

• Tourism-leisure infrastructure (snow runs, golf courses, stadiums, camps)

• Mining activities: quarries - mines

• Construction of roads, as well as railway lines

• Disturbing activities (recreation, military exercises, scientific research, vandalism)

• Destruction of riparian ecosystems

2.2.5. Ecological Functions

The components of an ecosystem interact with each other performing specific functions, which mainly include trophic relations, energy cycles, the change of diversity at all levels, both in space and time and, more generally, the development and evolution of the individual components of the ecosystem, or groups thereof, or the entire ecosystem.

Herbivores are primary consumers and are the balance regulators between producer-herbivorous organisms and consumers. Carnivores are secondary consumers and maintain the ecological balance between herbivorous animals and plants. Carnivores are, in turn, also controlled by carnivores (third-order-higher-order consumers). Consumers also include a category of microorganisms (microconsumers) that break down and decompose complex organic compounds. We distinguish these organisms into two main categories: the saprophages (worms, arthropods, etc.) and the decomposers, which consist of bacteria, fungi and other microorganisms.

All ecological systems are permanently open, that is, there are always external influences and they do not have clear boundaries. The ecological balance of such systems is never static but dynamic, even when we observe no change.

The reasons that today make forest ecosystems essential for maintaining both the ecological balance of the environment and the quality of life of people are mainly:

• the production and improvement of water quality

• their use as habitats for wild animals

• the improvement and preservation of biodiversity

• the improvement of the composition of the air

• the change in air movement and noise reduction

• the protection of the soil from erosion

• their use as recreational areas.

• carbon sequestration and concentration.

Thus, the preservation, improvement and expansion of forest ecosystems, as well as the rehabilitation of degraded ones, is the goal of a rational protection of the environment and especially of Protected Areas.

In the Study Area, the mixed forests of oak and other broadleaves have been degraded in the past years. The riparian forests are the environments with the greatest ecological interest and some of their ecological functions are the following:

Soil Stabilization : The conditions and biocommunities that develop in riparian zones are a unique combination of influences from both the aquatic and terrestrial environments. In a riparian zone, surface water is closely connected to the groundwater. Many riparian trees live off groundwater rather than river water, so they develop roots near the water table rather than across the soil profile. As they grow, the trees stabilize the bed materials with their roots, limit lateral erosion and force the river to dig a narrow and deep bed, with deep micro-ponds and burrows that are ideal for trout and other fish species. However, even these trees remain exposed to the larger floods that occur every few years or decades and undermine the bank by shifting the bed sideways.

Temperature : The riparian forest shades the river water, preventing aquatic vegetation from groblade too much and keeping the water temperature low. Colder water contains more oxygen and is suitable for more species of aquatic animals. The riparian forest connects aquatic and terrestrial ecosystems.

Nitrogen Recycling : Water flow determines the evolution of a riparian zone. The water transports nutrients (organic materials such as dead leaves, inorganic materials such as mud) to the entire surface of the zone, while the better the contact of the water with the -rich in organic matter- riparian soil, the more effective is the determining importance for the riparian zone nitrogen recycling.

"Green filter" : The riparian forest holds – like a huge green filter – and decomposes the pollutants and large amounts of nitrates that are washed away by the adjacent crops and settlements, thus

keeping the river clean. A riparian forest acts most effectively as a filter when it is biologically very productive, when it is large in area (multistory forest, soil rich in organic material), and when polluted water flows through it slowly rather than quickly through a channel.

Indicators of climate change: Riparian forests react to changing environmental conditions, with early leaf development or "terrestrialization" of plant communities (change to more terrestrial forests). Therefore, riparian forests can become indicators of climate change or any change in local hydrological conditions.

Biodiversity: In addition, riparian zones, despite covering narrow strips of land, strongly influence the biodiversity of the entire landscape. Although small in area, riparian zones are disproportionately rich in biodiversity because they host both aquatic and terrestrial species. They are the natural corridors most wild animals follow to cross human-altered landscapes. Thus, they allow many species to colonize new places or replace populations that have disappeared.

Ecological Values

The ecological value of the habitat types found in the Field Research Area is great. More specifically, the category of riparian forests is one of the rarest, but also the most interesting in Greece. These forests are also called alluvial or hygrophilous because they either grow in moist or seasonally flooded soils, or are strongly influenced by the surface and underground waters of adjacent water bodies. In the lowland rivers of our country there used to be large riparian forests. Today, few remain, mainly in some estuarine plains of northern and western Greece. In southern Greece and the islands, riparian forests are more limited, both in the species they contain and in the area they cover.

The riparian zones, and especially their hygrophilous forests, interact closely with the river, receiving flood waters and silt and providing biomass, food and shade. These forests "give birth" to clean water and act as a "green filter" between the agricultural lands and the river. Although small in area, riparian forests are disproportionately rich in plant and animal species, harboring both aquatic and terrestrial species – thus enriching the biodiversity of entire landscapes. They are key habitats, oases of life in a landscape that is becoming increasingly dry due to the overexploitation of natural fresh water reserves.

In rivers, wetlands and forests there are many species of birds with specialized needs. Each of these specialized species lives in a very specific habitat and needs special conditions to feed and nest. Some species live and nest exclusively in streams, others in marshes or only in forests. These species are an integral part of natural riparian zones. Riparian zones, particularly those in lowland floodplains, are home to many species of birds that exploit a wide range of food sources and roosting sites during their journeys. In rivers we often observe the proximity of different habitats, a feature

that increases the number of species that coexist in the area. Many water and forest species use "river corridors" as communication routes to cross a landscape that has been altered by human activities. This results in riparian zones being of great importance to birds, including many rare or endangered species. Of the total of 440 species of birds that have been observed in Greece, more than 200 species use the riparian zones. Some endangered species are of particular importance to riparian zones. Some aquatic species such as the rare mallard *Aythya nyroca* are completely dependent on shallow water, river lakes and riparian marshes. Many endangered birds of prey have a close relationship with riparian areas, such as the bald eagle (*Clanga pomarina*) which often nests or hunts in riparian woodlands, or the scavenger eagle owl (*Neophron percnopterus*) whose population has declined dramatically and is often seen foraging in riparian areas zones of the R.U. of Evros.

When the flood waters recede in late spring, ideal living conditions are created for many waterfowl and wading birds such as snipe (*Gallinago gallinago*), sandpipers (*Calidris* spp.), woodpeckers and sandpipers (*Tringa ochropus* and *T. glareola*), the little egret (*Porzana porzana* and *P. parva*), the little egret (*Crex crex*), especially some storks, such as the gray egret (*Ardea cinerea*), the white egret (*Egretta garzetta*), the little egret (*Ixobrychus minutus*), the night crow (*Nycticorax nycticorax*), for aquatics such as the coot (*Fulica atra*), the cormorant (*Phalacrocorax carbo sinensis*), the stork (*Ciconia ciconia*), the black stork (*Ciconia nigra*) etc.

The sixteen most valuable ecological values of the Riparian Forest of Northern Evros and Ardas are the following:

• Mosaic of biotopes and habitats of great ecological interest.

• Concentration of rich wildlife (breeding, feeding, nesting habitats of rare and rare fauna and bird species).

• Very productive forest ecosystem, due to the abundance of water and nutrients.

• Dry trees and logs, used as refuges from fish and terrestrial fauna, but also as nuclei for the creation of islets and new riparian stands.

• Refuge of predators, which regulate populations of harmful rodents and insects in neighboring crops.

• Water quality, as the forest acts as a microbiological and chemical natural filter. (Retention of nutrient salts carried away by agricultural crops and preservation of clean water.)

• Riverbank stabilization, soil retention and erosion control.

• Storage of water and portable materials during floods.

• Special "Photoclimate" in the ceiling of the clusters, as the light intensity is limited by the density of the upper floor.

• Temperature regulation of the adjacent aquatic ecosystem and control overgrowth of aquatic vegetation.

• Feeding habitat for the different types of freshwater fish: invertebrates, which feed on the dead leaves. And spawning habitat for fish various species of freshwater fish – the flood zone of a large river often produces greater numbers of fish than the riverbed itself and is a natural feeding habitat for spawn. Shelter for fish from the strong current of the river, in times of flood.

• Movement corridor for wildlife (migratory species) in the human-altered landscape.

• Reduction of wind intensity and noise pollution.

• Cultural and natural heritage, contribution to local economic, social and cultural development.

• Providing shade for livestock, recreation for people, clean water, timber, hunting and fishing.

• Anti-flood property

The above ecological values dynamically influence each other, creating a network of relationships and interdependencies. The mosaic of habitat types that occurs in the area creates a wide variety of habitats in terms of composition and structure which in turn influence and shape suitable conditions for the existence of a variety of species of wild flora and fauna, including rare bird species. These elements constantly change in space and time due to natural causes (e.g. ripening, aging, fires), often changing their identifying features themselves. Beyond the natural change, human actions, including scientific management, affect the ecological values of the area, changing in a different way and intensity the "natural" rate of change of these elements.

Landscape and biodiversity

The relationships between biodiversity and ecosystem heterogeneity as well as vegetation structure have been the focus of ecological research for the past 30 years. Fragmentation and alteration of the habitat mosaic of an area are considered to be the most important threats to biodiversity globally. In Mediterranean ecosystems, however, forest fragmentation (on a small scale) can be considered a positive process, coexisting with human activity for centuries, which, combined with the particular climatic conditions, has created particular forest landscapes characterized by intense mosaicism. The heterogeneity of the forest in the sense of different forms of cover (canopy, partially canopied, cultivated and barren areas) and the ecotones created between the different forms of cover also play an important role in shaping important feeding and nesting habitats for many species of fauna and in particular for the birds of prey.

The species most sensitive to changes in the spatial structure of a landscape are predators and species that require large habitats (such as birds of prey), as well as species of terminal plant communities (scale stage). The broadleaf forests of the study area, as they extend beyond the Greek borders, occupy huge areas and host a large number of predatory species.

It was found that the diversity of vegetation types and the fragmentation of homogeneous biotopes determine to the greatest extent the structure of the landscape. The structure of the landscape is closely related to the dominant type of vegetation, land uses and the degree of protection, i.e. it is closely linked to the human presence in the area, while applied research based on the above landscape indicators (riparian forest) showed that these indicators are related positively with the diversity of many groups of organisms in the area of interest.

2.2.6. Development trends in the Study Area without the project

Based on the available information and results of the field work and the relevant assessment of the state of the natural environment in the study area, it is concluded that the construction of the Wind Farm under study does not affect the development trends of the protected objects in the SPA areas of the Study area.

Overall, the development trends in the study area for habitat types, flora species and most bird species are positive and the prospects for their conservation status are favorable. The significant reduction in intensive cultivation of fields and their abandonment due to the "immigration" of residents and the decrease in the population of the surrounding settlements has contributed to this.

With regard to the designated species of the study area (Aetomachos, Lagona, Balkanotsiklitara and Nychtokorakas), **conservation objectives** in the Special Protection Zone GR 1110008 are: (MO1) the Determination of Desired Reference Values for the designated species (FRVs), (M02) the mapping of cores of distribution and critical habitats, (M04) the Monitoring of population trends of the target species and (M05) the drablade up of National Action Plans for the target species, through:

1. Drafting of habitat / habitat Management Plans.

2. The establishment, management and operation of Wildlife Refuges in the SPA, with improved specifications.

3. Informing and raising awareness of special groups of users of SPAs.

4. The planning and implementation of agro-environmental measures for biodiversity and the preservation of the rural landscape.

5. The identification and demarcation of Areas of High Natural Value (HNV).

6. Management arrangements for logging activities.

7. The mapping of sensitive areas within the SPA, for the correct positioning of development projects and activities.

8. The drablade up of a National Plan for Supervision and Custody.

9. National Program of strategic planning for the control of populations of invasive alien species and indigenous problem species.

10. Of the installation program of artificial nests, islets and designs for specific types of designation.

12. Planning for the creation and operation of Scavenger Feeding Areas

of Birds of Prey (Birds of Prey).

13. The mapping and demarcation of wetlands.

14. Taking compensation measures for large, linear infrastructure projects.

2.3. DESCRIPTION OF PROJECT UNDER STUDY

2.3.1. Project type and size

The project is an Wind Farm (W/F) and it is a facility that converts wind energy into useful mechanical or more commonly electrical energy. The main equipment of the W/F is the Wind Turbines (W/T). Wind Turbines -W/T are used to convert wind energy into work and then into electricity. W/T consists of:

- the base part (tower),
- the carriage (or nacelle) located at the top of the tower on which the generator and all auxiliary mechanisms are located
- the blade system (usually three).

W/Ts convert the kinetic energy of the wind into mechanical power. This mechanical power can be used for specific purposes (such as pumping water) or converted, which is the most common, through a generator into electricity.

Electrical energy with suitable mechanisms is transferred to the network and is available for consumption. Several W/Ts together in the same location make up a Wind Farm.

The Wind Farm at the Aetokorfi site will have a total rated power of 130.2MW and will consist of twenty one (21) W/Ts with a rated power of 6,200kW each. W/T indicative type Vestas V162-6.2MW have been selected. For the implementation of the project the following are required

- access works,
- internal road construction,
- layout of W/T ground area,
- wind turbine foundations,
- configuration of control room space
- building control room and
- interconnection works of the wind farm with the grid

2.3.2. Brief description of project or activity

The project concerns the installation of an electricity generation station using inexhaustible and environmentally friendly wind energy within the framework of Law 2244/94 "Regulation of electricity generation issues from renewable energy sources and from conventional fuels and other provisions".

The Wind Farm will operate as an independent power generation unit and will be connected to the electricity grid with all the necessary interconnection lines with the necessary protection, control etc. According to Law 2244/94 all the energy produced will be fed to the DSO/TSO grid.

The wind farm at the Aetokorfi site will have a total rated power of 130.2MW and will consist of twenty one (21) W/Ts with a rated power of 6,200kW each. W/T indicative type Vestas V162-6.2MW have been selected.

All of the W/T are located in the Trigono Municipal Unit. For the implementation of the project, access works, internal road construction, ground area shaping, foundation of wind turbines, construction of control rooms and interconnection works of the wind farm with the grid are required.

2.3.3. Geographic coordinates and project location

The project area is located in hills with forest woody vegetation, with grassland gaps and scattered scrub bordering agricultural land. The wind farm's FRA is located in forested areas with a mix of broad-leaved trees (oak, hemlock, hornbeam, maple, etc.). Access to the project area is via existing forest roads (dirt roads).

The coordinates of the W/T, the vertices of the project’s polygon, the control room and the new Substation in EGSA 87' and WGS 84 are shown in the tables below.

Table 2-17 W/T coordinates of the wind farm.

ΑΝΕΜΟΣ ΕΒΡΟΥ Μ.Ι.Κ.Ε.									
ΑΙΟΛΙΚΟΣ ΣΤΑΘΜΟΣ ΑΕΤΟΚΟΡΦΗ 130,2MW									
ΑΓ	Γεωγραφικές Συντεταγμένες					Υψόμετρο Εδάφους	Ύψος Πύργου	Διάμετρος Ρότορα	Ανώτατο ύψος ακραίου κινητού σημείου
Α/Α	ΕΓΣΑΧ	ΕΓΣΑΥ	WGSφ	WGSλ	Ενδεικτικός τύπος Α/Γ	(μ.)	(μ.)	(μ.)	(μ.)
1	672923.77	4612566.34	41° 38' 55.0667"	26° 04' 42.0521"	VESTAS V162 - 6,2MW	507	149.00	162.00	737
2	673309.46	4612434.72	41° 38' 50.5001"	26° 04' 58.5775"	VESTAS V162 - 6,2MW	556	149.00	162.00	786
3	673583.52	4612132.85	41° 38' 40.5034"	26° 05' 10.1018"	VESTAS V162 - 6,2MW	582	149.00	162.00	812
4	674058.18	4611934.70	41° 38' 33.7096"	26° 05' 30.3993"	VESTAS V162 - 6,2MW	561	149.00	162.00	791
5	674341.34	4611171.68	41° 38' 08.7618"	26° 05' 41.8304"	VESTAS V162 - 6,2MW	534	149.00	162.00	764
6	674306.84	4610613.14	41° 37' 50.6901"	26° 05' 39.7542"	VESTAS V162 - 6,2MW	509	149.00	162.00	739
7	674593.71	4610278.50	41°37'39.61"	26° 5'51.76"	VESTAS V162 - 6,2MW	502	149.00	162.00	732
8	675001.61	4610355.04	41°37'41.77"	26° 6'9.46"	VESTAS V162 - 6,2MW	471	149.00	162.00	701
9	675424.80	4610351.17	41°37'41.31"	26° 6'27.73"	VESTAS V162 - 6,2MW	467	149.00	162.00	697
10	677456.89	4610944.39	41°37'58.91"	26° 7'56.13"	VESTAS V162 - 6,2MW	442	149.00	162.00	672
11	678087.96	4610800.12	41° 37' 53.7400"	26° 08' 23.2607"	VESTAS V162 - 6,2MW	446	149.00	162.00	676
12	678001.44	4610029.90	41°37'28.84"	26° 8'18.67"	VESTAS V162 - 6,2MW	395	149.00	162.00	625
13	678137.21	4609524.31	41° 37' 12.3601"	26° 08' 24.0200"	VESTAS V162 - 6,2MW	387	149.00	162.00	617
14	678530.36	4608743.56	41°36'46.73"	26° 8'40.13"	VESTAS V162 - 6,2MW	350	149.00	162.00	580
15	679311.00	4608091.21	41° 36' 24.9763"	26° 09' 13.1613"	VESTAS V162 - 6,2MW	359	149.00	162.00	589
16	679907.55	4607824.79	41° 36' 15.8601"	26° 09' 38.6281"	VESTAS V162 - 6,2MW	358	149.00	162.00	588
17	680337.08	4607986.71	41° 36' 20.7576"	26° 09' 57.3468"	VESTAS V162 - 6,2MW	344	149.00	162.00	574
18	680805.47	4608100.72	41° 36' 24.0599"	26° 10' 17.6599"	VESTAS V162 - 6,2MW	325	149.00	162.00	555
19	681449.56	4608331.81	41° 36' 31.0215"	26° 10' 45.7189"	VESTAS V162 - 6,2MW	290	149.00	162.00	520
20	682199.56	4608457.56	41° 36' 34.4807"	26° 11' 18.2366"	VESTAS V162 - 6,2MW	217	149.00	162.00	447
21	682742.53	4608528.25	41° 36' 36.3243"	26° 11' 41.7564"	VESTAS V162 - 6,2MW	150	149.00	162.00	380

Table 2-18 Field coordinates of the control rooms.

ANEMOS EVROU M.I.K.E.		
AETOKORFI wind farm 130.2MW		
COORDINATES OF CONTROL ROOMS IN EGSA 87		
WT	X	Y
1	679404.43	4607960.07
2	679394.53	4607937.11
3	679417.48	4607927.21
4	679427.39	4607950.16
FIELD AREA = 625.0 sq.m.		

Table 2-19 Wind Farm polygon vertex coordinates

ΣΥΝΤΕΤΑΓΜΕΝΕΣ ΚΟΡΥΦΩΝ ΠΟΛΥΓΩΝΟΥ Α ΣΕ ΕΓΣΑ 87		
ΚΟΡΥΦΗ	X	Y
A1	672400,82	4612726,74
A2	672678,11	4613055,07
A3	672999,17	4613108,12
A4	673276,24	4612980,71
A5	673625,71	4612881,04
A6	673823,61	4612621,42
A7	674009,20	4612476,38
A8	674385,21	4612365,11
A9	674597,96	4612007,98
A10	674539,78	4611675,33
A11	674160,36	4611537,10
A12	673929,10	4611969,57
A13	673590,31	4612006,75
A14	673308,07	4611834,59
A15	673175,43	4612040,80
A16	672888,96	4612296,06
ΠΕΡΙΜΕΤΡΟΣ ΠΟΛΥΓΩΝΟΥ Π = 5.976,57μ.		
ΕΜΒΑΔΟΝ ΠΟΛΥΓΩΝΟΥ Ε = 1.609.859,54τ.μ.		
ΣΥΝΤΕΤΑΓΜΕΝΕΣ ΚΟΡΥΦΩΝ ΠΟΛΥΓΩΝΟΥ Β ΣΕ ΕΓΣΑ 87		
ΚΟΡΥΦΗ	X	Y
B1	674121,40	4611510,86
B2	674561,27	4611670,98
B3	674860,53	4611343,85
B4	674792,55	4610864,73
B5	674834,07	4610758,90
B6	675056,09	4610672,70
B7	675283,80	4610836,07
B8	675440,09	4610902,07
B9	675758,95	4610805,68
B10	675947,30	4610518,89
B11	675960,49	4610243,42
B12	675781,55	4610075,80
B13	675491,62	4610188,84
B14	675424,54	4610257,11
B15	675181,88	4610278,74
B16	674882,82	4610236,59
B17	674583,41	4610168,25
B18	674385,68	4610181,82
B19	674341,01	4610246,28
B20	674209,92	4610612,28
B21	674145,03	4610809,41
B22	674247,08	4611147,14
ΠΕΡΙΜΕΤΡΟΣ ΠΟΛΥΓΩΝΟΥ Π = 6.264,55μ.		
ΕΜΒΑΔΟΝ ΠΟΛΥΓΩΝΟΥ Ε = 1.479.787,97τ.μ.		

ΣΥΝΤΕΤΑΓΜΕΝΕΣ ΚΟΡΥΦΩΝ ΠΟΛΥΓΩΝΟΥ Γ ΣΕ ΕΓΣΑ 87		
ΚΟΡΥΦΗ	X	Y
Γ1	676994,86	4610646,26
Γ2	676920,77	4611016,30
Γ3	677107,19	4611349,05
Γ4	677521,89	4611475,72
Γ5	677866,49	4611299,49
Γ6	678285,70	4611310,13
Γ7	678579,72	4611039,66
Γ8	678598,29	4610603,20
Γ9	678414,80	4610361,50
Γ10	678522,27	4609912,15
Γ11	678638,55	4609293,84
Γ12	678039,93	4608994,05
Γ13	678024,53	4609344,54
Γ14	678049,87	4609607,71
Γ15	677994,83	4609861,02
Γ16	677886,74	4610040,93
Γ17	677959,81	4610408,92
Γ18	678002,25	4610836,92
Γ19	677937,59	4610904,24
Γ20	677758,29	4610944,00
Γ21	677546,73	4610870,51
Γ22	677317,85	4610819,26
Γ23	677181,87	4610656,53
ΠΕΡΙΜΕΤΡΟΣ ΠΟΛΥΓΩΝΟΥ Π = 7.923,73μ.		
ΕΜΒΑΔΟΝ ΠΟΛΥΓΩΝΟΥ Ε = 1.755.791,11τ.μ.		

ΣΥΝΤΕΤΑΓΜΕΝΕΣ ΚΟΡΥΦΩΝ ΠΟΛΥΓΩΝΟΥ Δ ΣΕ ΕΓΣΑ 87		
ΚΟΡΥΦΗ	Χ	Υ
Δ1	678027,19	4608968,32
Δ2	678644,72	4609271,48
Δ3	678911,72	4609124,09
Δ4	679065,88	4608810,48
Δ5	679038,82	4608563,45
Δ6	678764,08	4608247,30
Δ7	678565,19	4608335,60
Δ8	678431,22	4608734,38
Δ9	678109,03	4608773,69
ΠΕΡΙΜΕΤΡΟΣ ΠΟΛΥΓΩΝΟΥ Π = 3.183,71μ.		
ΕΜΒΑΔΟΝ ΠΟΛΥΓΩΝΟΥ Ε = 586.668,42τ.μ.		
ΣΥΝΤΕΤΑΓΜΕΝΕΣ ΚΟΡΥΦΩΝ ΠΟΛΥΓΩΝΟΥ Ε ΣΕ ΕΓΣΑ 87		
ΚΟΡΥΦΗ	Χ	Υ
Ε1	678782,94	4608233,90
Ε2	679068,07	4608580,29
Ε3	679412,20	4608628,77
Ε4	679651,53	4608519,28
Ε5	679785,95	4608358,10
Ε6	679946,56	4608369,72
Ε7	680453,92	4608519,79
Ε8	680982,81	4608617,04
Ε9	681348,08	4608869,31
Ε10	681761,24	4608781,33
Ε11	682099,65	4608995,36
Ε12	682412,05	4608961,60
Ε13	682818,99	4609069,88
Ε14	683188,23	4608845,36
Ε15	683281,89	4608437,17
Ε16	683001,78	4608046,59
Ε17	682531,92	4608023,11
Ε18	682242,45	4607912,24
Ε19	681886,74	4608008,83
Ε20	681755,42	4607918,57
Ε21	681665,75	4607989,44
Ε22	681351,43	4608082,09
Ε23	680975,94	4608105,86
Ε24	680551,98	4608009,75
Ε25	680396,82	4607998,00
Ε26	680205,23	4607867,64
Ε27	680067,68	4607830,91
Ε28	679935,82	4607767,18
Ε29	679846,34	4607800,15
Ε30	679662,91	4607824,03
Ε31	679549,79	4607881,73
Ε32	679403,08	4607925,20
Ε33	679372,60	4607938,95
Ε34	679249,84	4608021,51
Ε35	679165,10	4608158,22
Ε36	678898,31	4608076,81
ΠΕΡΙΜΕΤΡΟΣ ΠΟΛΥΓΩΝΟΥ Π = 10.444,63μ.		
ΕΜΒΑΔΟΝ ΠΟΛΥΓΩΝΟΥ Ε = 3.119.797,92τ.μ.		

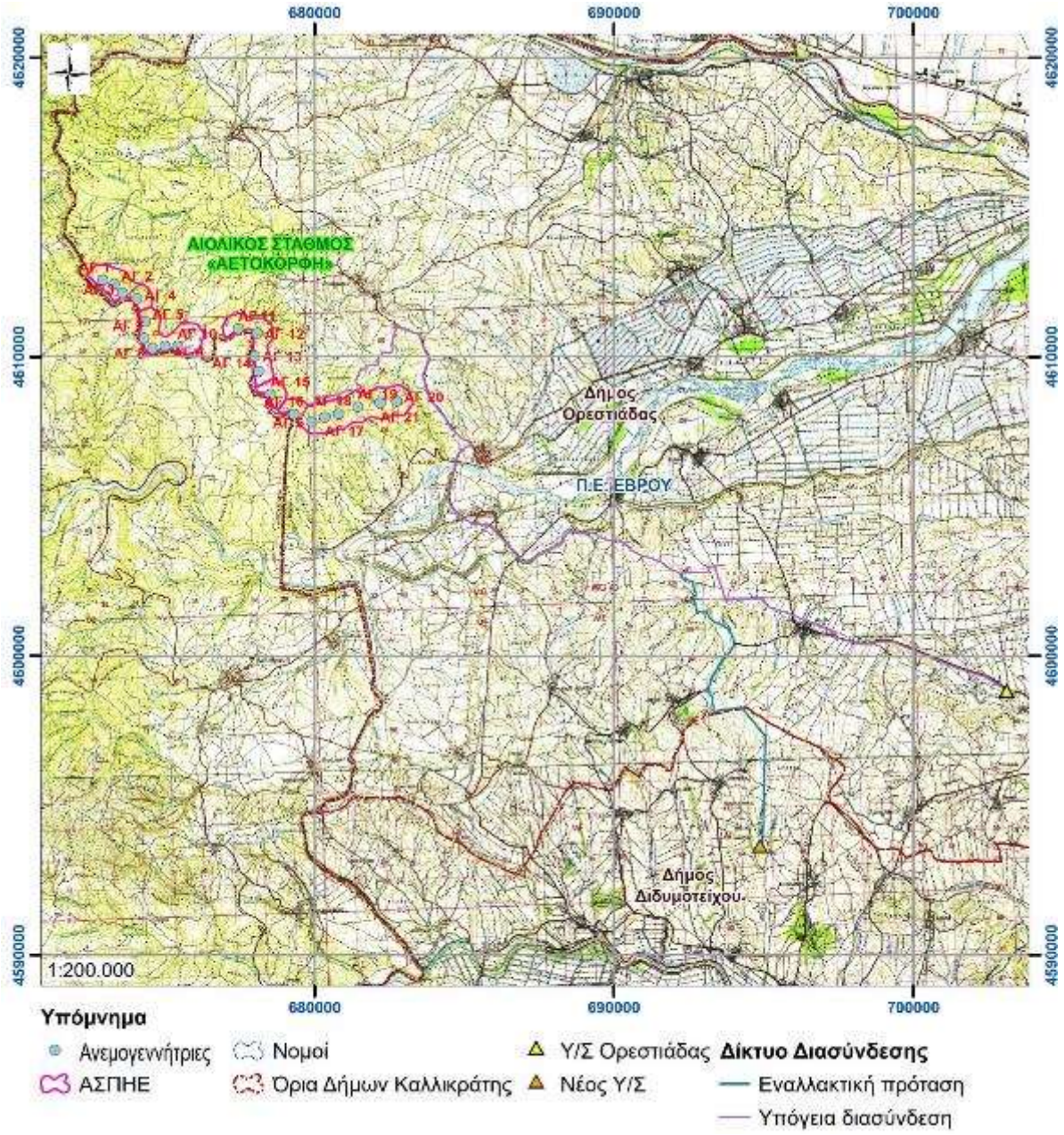

Figure 2-10 Depiction of project on 1:50000 GIS map

Figure 2-11 Excerpt of a general map of the area, especially in the area of the wind farm

2.3.4. Technical characteristics of W/T type Vestas V162-6.2MW

The complete technical characteristics of the W/T can be found in the appendix. A brief description of the mechanical equipment of an W/T follows, as well as some technical characteristics of the equipment of the Vestas V162-6.2MW, which are:

- rotor, which consists of a rotation axis and 3 blades and has a diameter of 162m.

- axis of rotation, which supports the blades, which are 81m long and are made of fiberglass.
- blades, consisting of two different aerodynamic sections which are joined to the axis of rotation with special devices (bearings), so that the blades are adapted at any moment to the particularities of the wind, thus achieving maximum aerodynamic effect and, thus, maximum energy production or even stopping rotation in extreme wind conditions.

The transfer of the torque due to the wind to the electricity generator is done through a gearbox. The W/T starts rotating when the wind speed exceeds 3m/s and shuts off for wind speeds greater than 20m/s. The generator is mounted together with all the electromechanical components of the W/T on the nacelle. The whole arrangement rests on a 166m high pillar.

For the operational needs of the project, one (1) control center will be constructed at a strategic point of the area, in order to control the operation of the wind turbines and measure the energy produced. Each W/T will be connected to a substation that will include a low voltage (LV) to medium voltage (MV) step-up transformer and through an underground MV line the generated energy will be transferred to a central electrical panel, which will be located in the control center.

For the implementation of the project, small-scale earthworks are required for the foundation of the W/T towers.

2.3.5. Road Construction Works

For the access to the site of the project and for the transport of the required equipment, road construction works with a total length of 22,085.91m will be carried out, of which 1,235.40m concern new access roads openings and 20,850.50m concern the improvement of existing roads.

It should be noted that the road construction study is based on the innovative method of transporting blades with "bladelifter" vehicles, in order to avoid excessive widening of the roads at the bends. Using this method, special vehicles (bladelifter) transport the blades at an angle as shown in the image below.

Figure 2-12: Transporting blades using a bladelifter vehicle.

In the section under study, indicative forest road construction of total length of 1800m, when transporting the blade with a blade-lifter, the required area of the deck is 10,078.00 sq.m. On the contrary, during the transport of the blades with a conventional truck, an additional area of 20,429.00 square meters would be required. In other words, there is a saving of 67% of the operation surfaces.

A total of seventeen (17) road sections were studied with forest road specifications of category C.

The following table shows in detail the roads proposed for opening & improvement, their classification, their type, their length and the beginning and end of the route:

Table 2-20 Proposed roads for construction and improvement.

IMPROVEMENT OF EXISTING AND DEVELOPMENT OF NEW FOREST ROADS							
N/A	Characterization	Remarks	Length m	Engraving Authority		End of Engraving	
				X	Y	X	Y
1	Category 3 forest road	ACCESS IMPROVEMENT "ROAD 1"	6,152.86	681683.42	4612153.58	679426.1 7	4607916.4 1
2	Category 3 forest road	ACCESS IMPROVEMENT "ROAD 2"	49.84	681056. 40	4612018.4 9	681031.94	4612061.9 2
3	Category 3 forest road	ACCESS IMPROVEMENT "ROAD 3"	1 ,960.16	679860.15	4607816.95	678418.54	4608729.26
4	Category 3 forest road	ACCESS IMPROVEMENT "ROAD 4"	3,141.00	678482.65	4608737.11	677503.62	4610933.15
5	Category 3 forest road	IMPROVEMENT OF ACCESS ''ROAD 5''	2,962.6 3	677443.79	4610939.19	675049.34	4610349.45
6	Category 3 forest road	ACCESS IMPROVEMENT "ROUTE 6"	1,198,72	675366.90	4610282.11	674282.29	4610524.26
7	Category 3 forest road	ACCESS IMPROVEMENT "ROAD 7"	764.95	674317.15	4610621.69	674347.23	4611160.45
8	Category 3 forest road	ACCESS IMPROVEMENT "ROUTE 8"	1,269.44	674301.62	4611198.32	673594.43	4612129.36
9	Category 3 forest road	ACCESS IMPROVEMENT "ROAD 9 "	2,666.30	679732.35	4607802.91	682152.91	4608360.27
10	Category 3 forest road	ACCESS IMPROVEMENT "ROAD 10 "	150.12	673299.16	4612443.50	673151.98	4612467.36
11	Category 3 forest road	ACCESS IMPROVEMENT "ROAD 11 "	409.88	673594.14	4612138.41	673350.60	4612409.80
12	Category 3 forest road	ACCESS IMPROVEMENT "ROAD 12 "	40.23	673229.65	4612497.94	673218.63	4612459.25

13	Category 3 forest road	ACCESS IMPROVEMENT ' '13 ROAD ''	40.03	682602.26	4608484.30	682573.76	4608512.41
14	Category 3 forest road	ACCESS IMPROVEMENT ' '14 STREET ''	44.36	679482.27	4607939.06	679494.97	4607898.44
Total			**20,850.50**				
N/A	**Characterization**	**Remarks**	**Length m**	**X**	**Y**	**X**	**Y**
1	Category 3 forest road	INTERIOR ROAD "BRANCH 1"	556.17	682172.99	4608431.71	682603.71	4608547.78
2	Category 3 forest road	INTERIOR ROAD "BRANCH 2 "	211.09	673187.61	4612463.17	673330.38	4612320.89
3	Category 3 forest road	INTERIOR ROAD "BRANCH 3 "	468.15	673298.27	4612339.02	672941.43	4612521.68
Total			**1,235.40**				

Improvement of Existing Roads

The need for transport of the blades and parts of the W/Ts, the access of the necessary for the installation of the W/T cranes as well as the transport of the rest of the necessary equipment for the operation of the wind farm, make it necessary to improve the existing access road. The improvement of the existing roads will be done in accordance with the road construction specifications defined by the supplier and installer of the wind turbines in order to ensure safe transportation and installation.

Access to the installation polygon of the proposed wind farm

Access to the Wind farm polygon area will be via existing roads.

Initially, access is realised by the Egnatia Road Ardanio-Ormenio vertical axis. Then, from the junction of the community of Palli and through the municipal roads we head to the community of Pentalofos, where through the existing dirt roads the installation site of the Wind Farm may be accessed.

- The existing road to be improved is a dirt road, has a width of approximately 3.0-4.0 meters with a south-west, east and north-west direction from the whole of the W/T of the Wind Farm.

Below is a satellite image excerpt of the existing access roads.

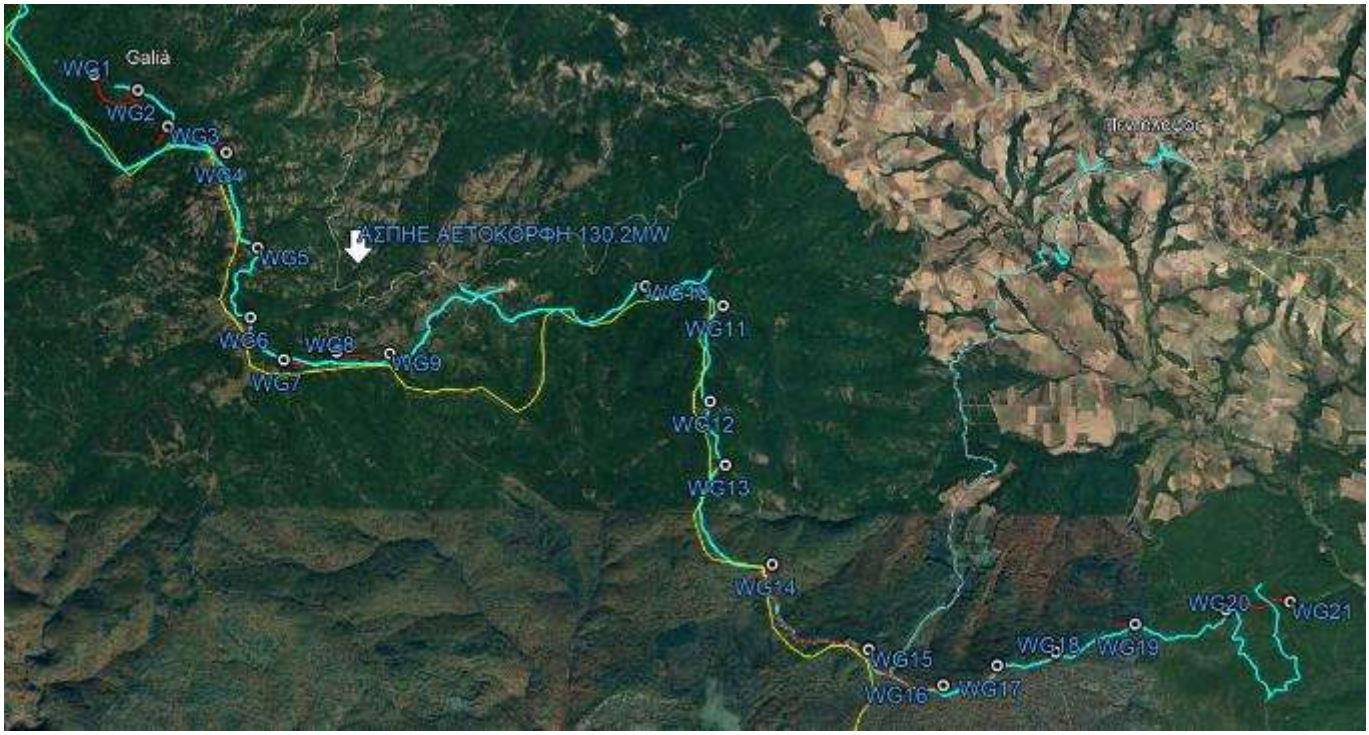

Figure 2-13: Satellite image (in blue the existing roads and in red the new roads under construction)

Suggested roads

A/A 1: ACCESS IMPROVEMENT "ROAD 1"

This is the main approach road to the wind farm. It starts south of the community of Pentalofos at an altitude of 242.00m with a south-west direction and ends near the control room at an altitude of 360.00m.

The longitudinal maximum positive slope is +15.922% and -17.286% the negative. The total length of the road is 6,152.86m.

A/A 3: ACCESS IMPROVEMENT "ROAD 3"

This is the access road that starts from the square of W/T 16 with an altitude of 358.00m in a north-west direction, it passes through the crane erection square of the wind turbine W/T 15 and ends between intersections 6 and 7 of access road 4 at an altitude of 357.38m.

The longitudinal maximum positive slope is +8.985% and -10.932% the negative. The total length of the road is 1,960.16 m.

A/A 4: ACCESS IMPROVEMENT "ROUTE 4"

This is the access road that starts from the square of W/T 14 at an altitude of 350.00m in a north-west direction, it passes through the crane erection square of wind turbine W/T 13, through the square of W/T 12 and the crane erection square of W/T 11 and ends at the square of wind turbine W/T10 at an altitude of 442,00m.

The longitudinal maximum positive slope is +12.735% and -9.638% the negative. The total length of the road is 3,141.00m.

A/A 5: ACCESS IMPROVEMENT "ROUTE 5"

This is the access road that starts from the square of the wind turbine W/T10 with an altitude of 442.0m in a south-west direction, it passes through the crane erection square of wind turbine W/T 9 and ends at the square of wind turbine W/T 8 at an altitude of 471.00m.

The longitudinal maximum positive slope is +13.027% and -12.992% the negative. The total length of the road is 2,962.63m.

A/A 6: ACCESS IMPROVEMENT "ROUTE 6"

This is the access road that starts from the intersection D48 of the access road under improvement (ACCESS IMPROVEMENT "ROAD 5") with an altitude of 470.497m in a west and north direction, it passes through the square of the wind turbine W/T 7 with an altitude of 502m and ends at the crane erection square of wind turbine W/T 6 at an altitude of 509.36m.

The longitudinal maximum positive slope is +12.153% and -6.519% the negative. The total length of the road is 1,198.72m.

A/A 7: ACCESS IMPROVEMENT "ROAD 7"

This is the access road that starts from the square of the wind turbine W/T 6 with an altitude of 509.00m in a northerly direction and ends at the square of the wind turbine W/T 5 at an altitude of 534.00m.

The longitudinal maximum positive slope is +12.139% and -6.797% the negative. The total length of the road is 764.95m.

A/A 8: ACCESS IMPROVEMENT "ROUTE 8"

This is the access road that starts from the square of W/T 5 with an altitude of 534.00m in a north-west direction, it passes through the crane erection square of wind turbine W/T 4 and ends at the square of wind turbine W/T 3 at an altitude of 582.00m.

The longitudinal maximum positive slope is +11.775% and -8.420% the negative. The total length of the road is 1,269.44m.

A/A 9: ACCESS IMPROVEMENT "ROAD 9"

This is the access road that starts from section D3 of the access road under improvement (ACCESS IMPROVEMENT "ROAD 3") with an altitude of 359.33m in an east and north direction, it passes through the crane erection squares of wind turbines W/T 16, W/T 17 and W/T 18, from the square of W/T 19 and ends at the crane erection square of wind turbine W/T 20 in altitude 222,685m.

The longitudinal maximum positive slope is +4.059% and -12.342% the negative. The total length of the road is 2,666.30m.

A/A 10: ACCESS IMPROVEMENT "ROAD 10"

This is the access road that starts from the square of W/T 2 with an altitude of 556.00m in a westerly direction and ends at a point with an altitude of 546.02m.

The longitudinal maximum negative slope is -7.553%. The total length of the road is 150.12m.

A/A 11: ACCESS IMPROVEMENT "ROAD 11"

This is the access road that starts from the square of W/T 3 with an altitude of 582.00m in a north-west direction and ends at the square of the wind turbine W/T 2 at an altitude of 556.00m.

The longitudinal maximum negative slope is -9.320%. The total length of the road is 409.88m.

A/A 12: ACCESS IMPROVEMENT "ROAD 12"

It is a gradient change ramp starting from point 673229.65, 4612497.94 with an altitude of 549.31m in a south-west direction and ends at a point between intersections 2 and A'3 of the access road under improvement (ACCESS IMPROVEMENT "ROAD 10") with an altitude of 550.98m.

The longitudinal positive slope is +4.142%. The total length of the road is 40.23m.

A/A 13: ACCESS IMPROVEMENT "ROAD 13"

It is a gradient change ramp starting from point 682602.26, 4608484.30 with an altitude of 155,773m. in a north-west direction and ends at a point between intersections 5 and A'16 of the road under construction (OPEN ROAD "BRANCH 1") with an altitude of 155.63m.

The longitudinal negative slope is -0.359%. The total length of the road is 40.03m.

A/A 14: ACCESS IMPROVEMENT "ROAD 14"

This is the access road that starts from a point between the intersections A96 and 458 of the access road under improvement (ACCESS IMPROVEMENT "ROAD 1") with an altitude of 356.76m. in a south-eastern direction and ends at intersection 31 of the access road under improvement (ACCESS IMPROVEMENT "ROAD 3") with an altitude of 385.31m.

The longitudinal positive slope is +3.501%. The total length of the road is 44.36m.

The following technical works will be carried out on the specific road sections:

- Improvement of the quality of the road by restoration of the road surface and coating of crushed material 3A with a road width of 5.0 m. (under 0.1m thickness - P.T.P. (O)-150).
- Digging a trench along the entire length of the road for water flow and project safety.
- Construction of small techniques, where necessary for the safe operation of the road, which will be studied in the submission of the road construction study.

Attached to annex 16.5 is a plan (plan: 299.5.1.6_1&2 "Topographic map of the project and accompanying projects", cl. 1 : 5,000) in which all sections of the forest road under improvement are mapped.

Opening of a new forest road

The new road construction includes the access road - approach of the W/T within the polygon of the wind farm. This is a new opening of forest roads, with a total length of 1,235.40 m.

Suggested routes:

A/A 1: "BRANCH 1" ROAD

This is the opening of a new forest approach road to wind turbine W/T 21 of the Wind Farm.

The opening of the new section has a total length of 556.17m, starting from the square of W/T 20 at an altitude of 217.00m in an easterly direction and ends at the crane erection square of wind turbine W/T 21 at an altitude of 150.00m.

The longitudinal maximum negative slope is -12.047%.

A/A 2: "BRANCH 2" ROAD

This is the opening of a new forest approach road to wind turbine W/T 1 of the Wind Farm and is crossed in reverse.

The opening of the new section has a total length of 211.09m, starting from the A2 section of the access road under improvement (ACCESS IMPROVEMENT "ROAD 10") at an altitude of 548.27m. in a south-east direction and ends at a point with an altitude of 538.40m.

The longitudinal maximum positive slope is +11.556% and -10.602% the negative.

A/A 3: "BRANCH 3" ROAD

This is the opening of a new forest approach road to wind turbine W/T 1 of the Wind Farm.

The opening of the new section has a total length of 468.15m. It starts from cross-section 4 of the road under opening ("BRANCH 3" ROAD OPENING) at an altitude of 541.081m. with a west and north direction and ends at the square of the wind turbine W/T 1 at an altitude of 507.00m.

The longitudinal maximum negative slope is 12.002%.

The roads will be constructed as a C' category forest roads according to the following geometric data and the standard cross-section that follows. In detail, the geometric elements of the new road construction are:

- road width 5m
- maximum longitudinal slope 12% - (subject to conditions 14%) with vertical adjustment radius R = 300m
- horizontal radius R = 30m.
- alignment slope 0.5% (double slope)
- triangular trench 1.2m wide and 0.4m deep.
- construction of small techniques, where necessary for the safe operation of the road,

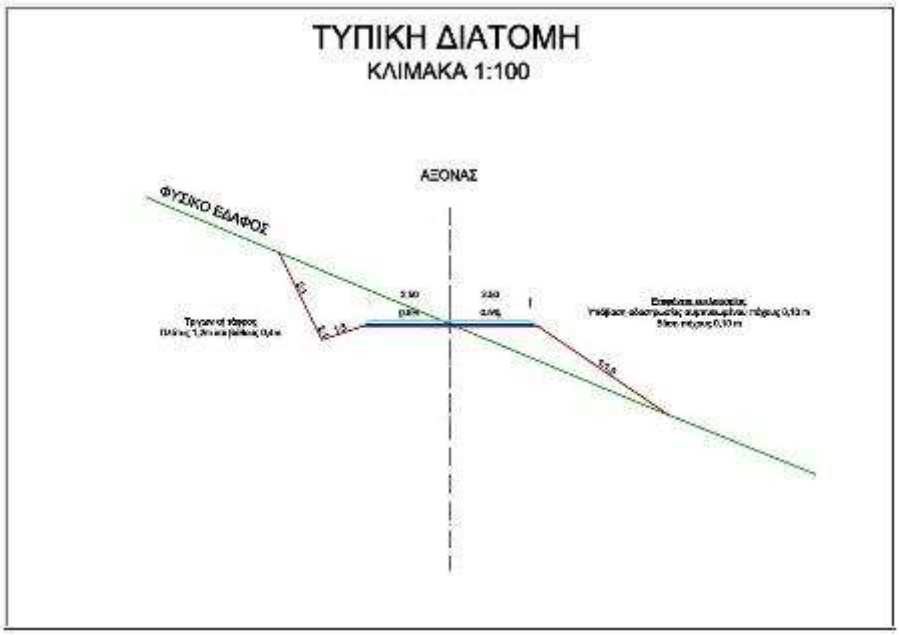

Figure 2-14: Typical Cross Section.

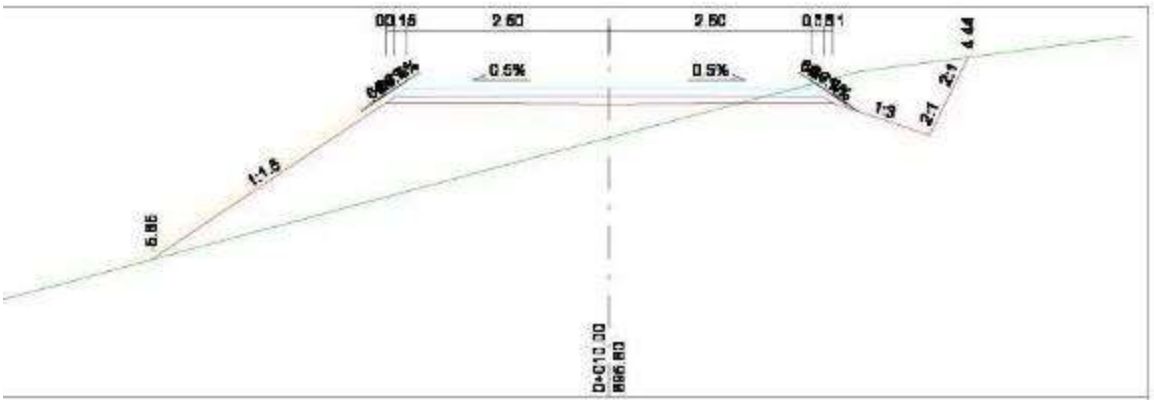

Figure 2-15: Adverse Section with embankment.

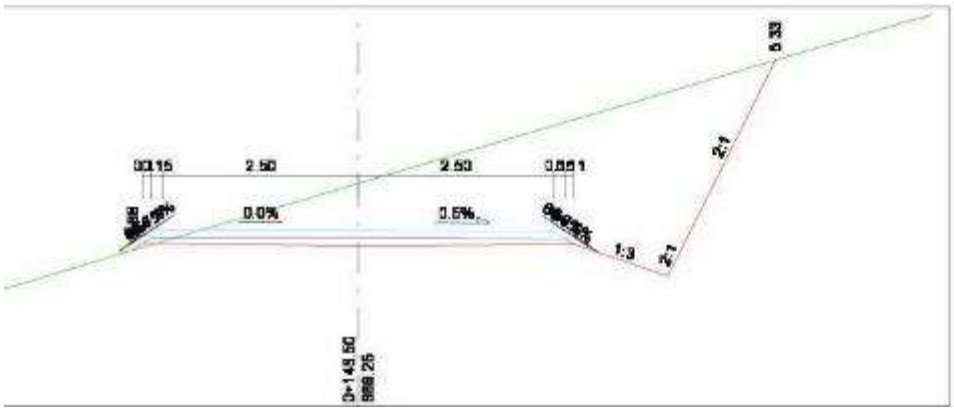

Figure 2-16: Adverse Section with Trench.

2.3.6. Configuration of wind turbine erection sites

The works required for the formation of the construction sites are:

- excavation in rocky ground for the construction of the desired square measuring 27m x 36m.
- construction of compacted embankment with possible configuration of terraces in case loose soils are revealed for the construction of the desired square.
- coating of the final surface with inert materials type 3A and where it is required to form the subgrade of the final surface with a minimum slope of 0.2%
- construction of a 125.0m long crane shaft. and 10.0 m wide (within the approach road of the W/T, where this is possible).
- construction of the crane installation area for the erection of the wind turbines (within the square) measuring 21.0m x 27.0m at 0% slope with a compacted pavement bearing layer at 100% dry bulk density in the modified Proctor test.

- Configuration of a storage square of a blade measuring 5.0m x 87.0m for W/T 1, 2 and 3 that will be built with the "just in time" assembly method and taking into account the use of a telescopic crane.
- In the remaining 18 W/Ts, an additional space (square) with dimensions of 20.0m x 87.0m will be created for depositing the blades and a space (square) measuring 19.0m x 61.5m for the deposition of the tower sections.

2.3.7. Foundation of wind turbines

The foundation works of the wind turbines will be done according to the instructions of the supplier company of the wind turbines.

The works required for the foundation of the wind turbines are:

- excavation in rocky ground for the construction of the desired square 27.0m x 25.5m and a depth of 3m
- coating and compaction with type 3A aggregates at the base of the foundations
- concreting the base of the wind turbine with cleaning concrete type C30/37
- installation of metal wind turbine base
- supply, forming and installation of rebar
- foundation concreting with concrete type C30/37 and C50/60

2.3.8. Configuration of control room space

The works required for the configuration of the space measuring 50.0m x 50.0m for the installation of the control houses are:

- excavation in rocky ground for the construction of the room
- coating the final surface with inert materials type 3A
- access configuration
- placement of control rooms
- installation of fencing

The installation of three prefabricated houses - ISOBOX type - will be chosen, each measuring 2.6m wide and 8.0m to 10.0m long, in a specific location of the wind farm. The houses will include the following areas:

- ✓ Medium voltage panel space.
- ✓ Office to monitor and control the operation of the farm & WC
- ✓ Storage space

2.3.9. Operation surfaces

The areas of intervention surfaces of the overall project are listed below.

MEASUREMENT TABLE OF INTERVENTION SURFACES	
Competence of Didymoteicho Forestry Office	
Wind Farm Access Road	92211.67
Wind Farm Internal Road Construction	13837.80
Wind Turbines Erection Square	153473.24
Control House	4000.00
Total (sq.m.)	**263522.71**
Total (1/10 ha)	**263.52**

2.3.10. Grid connection

For the safe injection of energy from a Wind Farm, a method is usually chosen depending on:

- ✓ The power of the park and any other neighboring parks.
- ✓ The distance from existing S/S and existing H.V. lines.
- ✓ The robustness of the network at the connection point.

The connection of the W/F to the network is proposed to be made at the existing substation (S/S) of Orestiada. The proposed 33kV medium voltage underground line of the interconnection will have a total length of approximately 36.24km and will be built along the base of the existing roads.

Alternatively, the connection to the grid could be made in a new 33/150kV Substation in the route zone of the KYT NEAS SANTAS – ORESTIADAS transmission line with an underground medium voltage cable, with a total length of approximately 35.63 km.

Figure 2-17: Map of the grid connection of the Wind Farm

3. ASSESSMENT AND EVALUATION OF IMPACTS

3.1. GENERAL

Chapter 3 describes, assesses and evaluates the potential significant impacts that the project under study may cause on the structure and functions of the study area and draws conclusions as to whether the integrity and conservation objectives of the Natura 2000 area that constitute the S.A. of this SEA study. The special characteristics and special environmental conditions that prevail in the protected area, as recorded by the field work and the processing of the available bibliographic data, are taken into account.

The construction of the project under study is a special technical construction with medium-scale impacts on the environment both during the construction phase and during the operation of the Wind Farm in relation to the data of the existing state of the environment in the area. The wind farm under licensing belongs to Group 10 of the MD YPEN/DIPA/17185/1069 (Government Gazette 841B΄ / 24-2-2022) and is classified in Environmental Subcategory A1. The proposed site is environmentally compatible with the planned activity and the preparation of the present SEA study is required, as :

- Part of the project (polygon E) is located very close to the NATURA 2000 network area with code GR 1110008.

- The interconnection to the new 33/150kV Substation is made by an underground medium voltage cable, with a total length of approximately 35.63 km, along the existing roads, part of which passes through the area of the NATURA 2000 network with code GR 1110008 .

- W/T20 is located 13.80 km west of the Wildlife Refuge named "Kalos Gialos", Decision 73891/2079/1-6-90, Gazette 354/12-6-90.

- Obeys the prescribed distances from the nearest settlements (Komara at a distance of 3.2 km from W/T 20, Therapio at a distance of 3.6 km from the wind turbine W/T 18, Pentalofos at a distance of 3.7 km from W/T C 12, of Wind Farm "Aetokorfi")

The design of the underground cable of the alternative interconnection with a total length of approximately 35.63 km of the Wind Farm with the new substation on the KYT NEAS SANTAS - ORESTIADAS transmission line, in the wider area of the Sitochorion settlement, is located at a distance of:

- 4.4 km east from the Archaeological site named "Mikri Doxipara-Zone, Plutos Kyprinou Zone A" (MYPPO/GDAPK/ARCH/A1/Φ43/21634/911, Gazette: 58/AAP/2011-04-06, YMPO /GDAPC/ARCH/A1/Φ43/53573/2466, Gazette: 169/AAP/2011-06-27)

- 3.8 km north and east of the Archaeological site named "Mikri Doxipara-Zone, Plutos Kyprinou Zone B" (MYPPO/GDAPC/ARCH/A1/Φ43/21634/911, Gazette: 58/AAP/2011-04-06 , YPPO/GDAPC/ARCH/A1/Φ43/53573/2466, Official Gazette: 169/AAP/2011-06-27)
- 3.66 km north and east from the Archaeological site named "Elafochori Evrou" (YA YPPE/A1/Φ19/17176/696, Gazette: 731/B/1979-08-30)
- 9.60 km north and east from the Newest Monument "Koukoulospito, Metaxades, Evros, owned by the Community" (YAMATH/3223, Gazette: 605/D/1997-07-16, YPPO/DILAP/G/4700 BC ./9785, Official Gazette: 228/B/1998-03-11)
- 9.80 km north and east from the Archaeological site "Old churches of Paliouri" (YA YPPE/A1/Φ19/17176/696, Gazette: 731/B/1979-08-30)
- 8.00 km north and east from the Newest Monument "Building, Vrysika, Evros, allegedly owned by Ch. Grozoudi" (YA YPPO/DNSAK/39794/1049", "Government Gazette: 836/B/2005-03-21)

The above information was taken from the map of the Archaeological Land Registry.

- Located at a distance of 2.57 km west from the nearest Wind Farms, equipped with a Production License, based on the RAE Map (23/11/2022).

- It is located within the Zone of Forestry - Logging and Integrated Ecodevelopment, based on Map P.2a of the Regional Spatial Framework of the Region of Eastern Macedonia and Thrace (figure 2.3).

- It is located (W/T 21 & W/T 22) near a planned Hydroelectric Station > 25 MW and Photovoltaics > 2 MW , Border Station, Extensive Trans-European Network, based on Map P.2c of the Regional Spatial Framework of the Region of Eastern Macedonia and Thrace (figure 2.2).

- W/T 20 is located at a distance of 2.77 km from the nearest mobile phone antenna (1201748, WIND, Near Pentalofos, Evros) and at a distance of 2.78 km from the next closest (1002690, VODAFONE , Thesi Tsouka, D) D. Pentalofou). (fig. 2.1)

Below is a brief assessment of the expected environmental impacts in the construction and operation phase of the project under study.

✓ **Atmosphere**

Construction Phase: Gas emissions are limited to the exhaust gases from the operation of the machines and vehicles that will be used during the installation work of the wind farm. Fumes emissions can pose a hazard to personnel working near the source of the emission due to inhalation, however no problems are expected as all work will be carried out outdoors. For the operation of

machinery and the movement of vehicles and with the aim of limiting the emission of dust, these spaces must be moistened with water to limit its dispersion to the atmosphere.

Operation Phase: During the operation phase there will be no significant dust emissions. From the surface of the W/T square, which will be covered, on days when the wind is strong and during the movement of vehicles, dust and particles will be carried and dispersed.

✓ **Water resources**

Construction Phase: It is not expected to cause negative effects on local underground aquifers, nor on the important underground aquifers of the wider area. Also, the excavations of the main and accompanying works, and the foundation of the wind turbineσ will be done at a depth at which the underground aquifers are not affected.

Operation Phase: Same as construction phase.

✓ **Morphology - Soil - Landscape**

Construction Phase: It is expected that a small burden will be caused as the road connection works will be carried out for the most part on existing roads with the improvement of existing road construction up to 5 m wide in places near the border line of Greece - Bulgaria, where there are significant gaps and bare surfaces. The earthworks that will be carried out concern a very small area in relation to the study area in an oak forest.

Operation Phase: The installation and operation of Wind Farm is a new input in the landscape of the wider region. The size of the wind turbines constitutes a significant change in the natural landscape and changes the perspective of the area.

✓ **Acoustic Environment**

Construction Phase: An increase in the noise level is expected during the construction phase, which may occasionally exceed the statutory limits.

Operation Phase: During the operation phase, noise emissions from the project under study are at a low level and do not extend over a long distance. As can be seen from the relevant noise study of the project, the effect of the Wind Farm is very small.

✓ **Fauna - Bird fauna**

Construction Phase: There may be a loss of roosting, feeding and breeding habitats for fauna and avian species due to noise, but also locally due to destruction of habitats of interest to living organisms. The impact is small to negligible, as on one hand the road construction projects mainly include improvements to existing roads, and on the other hand no nesting sites of important fauna

and bird species were identified at the W/T sites. Due to the location of the Wind Farm in a forest area and the recording of several species of woodpeckers, it is proposed to carry out pre-construction monitoring and recording of any nesting sites along the road improvement projects and the construction of W/T squares. It is also recommended to start logging and earthworks after fledging and removal of woodpecker chicks from the nests (End of May).

Operation phase: There may be visual and acoustic disturbance resulting in the partial displacement of species from the area, which is a reversible impact, due to the significant degree of adaptation of the species. There may be mortality and injuries to birds and mammals (bats) from an impact on the blades of the W/T, which, as shown in the relevant chapter of this document, was estimated at very low levels. The project operator will install a special collision detection and avoidance system, which operates over a long radius and significantly reduces expected collision fatalities.

Cultural environment - Spatial planning

Below the spatial relationships of the Wind Farm with the Archaeological sites are illustrated (source: Archaeological Land Registry) along with other points of interest, as well as their location on the maps of the Regional Spatial Framework of the Region of Eastern Macedonia - Thrace (source: FEK 248/A.A.P ./25-10-2018) .

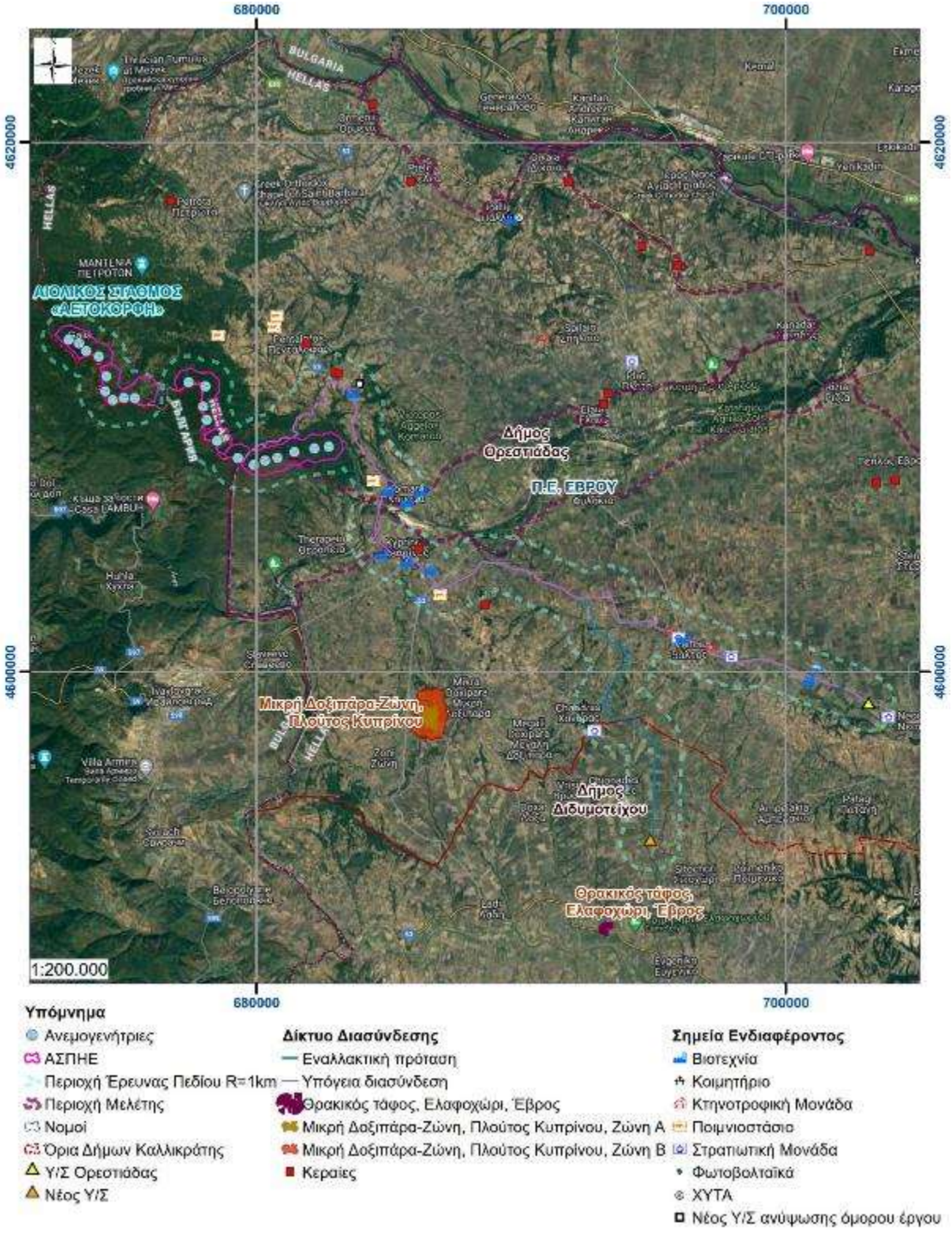

Figure 3-1. Archaeological Sites and points of interest in the wider area (source: Archaeological Land Registry, downloaded 09/18/2022)

Figure 3-2 Map P.2c – "Technical Infrastructure Networks and Units", Regional Spatial Framework of the Region of Eastern Macedonia & Thrace, Official Gazette 248/A.A.P./25-10-2018

Figure 3-3 Map P.2a – "Spatial Organization of the Region", Regional Spatial Framework of the Region of Eastern Macedonia & Thrace, Official Gazette 248/A.A.P./25-10-2018

3.2. EFFECTS ON HABITAT TYPES AND FLORA SPECIES

3.2.1. Impacts related to habitat change

In terrestrial ecosystems the main pressure that causes habitat change is the occupation of natural surfaces for other uses. This fact causes effects such as habitat fragmentation, minimization of soil aeration, erosion, degradation of soil quality, which ultimately can cause immediate degradation of a habitat or its loss and replacement by another type of habitat.
In the case of the project under study, the direction of the interventions is limited as much as possible to places where the minimum possible deforestation will be required, in places with gaps within the forest. Any damage to forest and natural vegetation in general will be limited to the minimum possible. Also, the removed plant land will be properly preserved, so that it can be used in phytotechnical restorations.

For the project under consideration, there is no risk of fragmentation of habitats as these are individual interventions at the construction sites of the W/T, which are at a significant distance from each other, and most of the Wind Farm connecting roads are existing roads that will be improved. Additionally, these are forest roads and not closed highways which cause the phenomenon of habitat fragmentation. Also, the application of the method of transferring the blades of the W/Ts with a blade-lifter, reduces the required surface area of the deck by 67%, resulting in the minimization of interventions in native forest vegetation and the reduction of the impacts from earthworks.

The results of the evaluation of the elements of the natural environment in the FRA and in the wider area of the project under study, demonstrated the good conservation status of the types of habitats and flora species and the favorable prospects for their conservation.

3.2.2. Implications in relation to climate change

Climate change causes fluctuations in the life cycles of plants and animals. The extreme conditions it causes, such as floods, droughts and fires, alter the characteristics of habitats and the species that live in them.

The local effect of the change in temperature and the change in the movement of air masses around the W/Ts is of small intensity and negligible.

The operation of the Wind Farm is in line with Europe's Climate Change objectives. The installation of energy production units from Renewable Sources aims at protecting the environment and dealing with climate change, as well as weaning off fossil fuels. The promotion of renewable energy projects is a strategic choice of the country's energy policy.

3.2.3. Effects of overexploitation of land and water

In the case of the project under study, there will be an intervention in places of native natural vegetation in an oak and other broadleaf forest. The construction of the Wind Farm does not require the use of significant areas, as it is a point project in terms of the positions of the W/T and linear in terms of the improvement of the access roads. It is also an energy production project from the kinetic energy of the air, and does not exploit other natural resources during its operation (water, soil).

In relation to water resources, the operation of the Wind Farm does not affect the physical distribution of the water resources of the underground aquifers, nor their quality.

3.2.4. Impacts from invasive alien species

Invasive alien species can replace native species by occupying their habitats, thereby reducing their survival and abundance, ultimately leading to a loss of biodiversity.

During the work process for the project under study, the chances of the invasion of alien species of flora, weeds, diseases and pests are increased through the transportation of bulk paving materials and topsoil. During the phytotechnical restoration process that will follow, preference will be given to trees and shrubs perfectly adapted to the natural habitat, in order to spatially limit the invasion of foreign species. Phytotechnical work will be done in strict compliance with phytosanitary rules for plant species and the management of plant land.

During the work process, as far as the fauna is concerned, the chances of foreign species invading in the case of the implementation of the project under study are negligible, and it concerns microorganisms and invertebrates that may be transported with the materials (vegetable soil, etc.) or the work vehicles.

3.2.5. Effects of pollution and eutrophication

Pollution and eutrophication occur when excessively harmful substances such as fertilizers and industrial chemicals enter an ecosystem, thereby exceeding the ecosystem's ability to maintain its natural balance. The result is that all these components end up in soil, groundwater, surface water and seas, leading to changes in ecosystems.

In the case of the project under study, excavation products will not be deposited in streams and rivers to ensure the free flow of their waters.

Regarding liquid waste, any kind of burning of materials in the project area is prohibited, as well as the disposal of used mineral oils on the ground. The replacement of the used mineral oils should be done in a specific area, in which there will be a provision to avoid soil pollution with a cement layer

and a network to collect potential leaks. The management of used mineral oils will be done in accordance with the provisions of Greek Decree 82/2004 (Government Gazette 64/A/04).

Regarding solid waste: The trucks used to transport the materials and parts of the individual parts of the W/Ts, have their cargo insured and move, where possible, on roads that do not pass through settlements. The contractors who are responsible for the transport of the materials are obliged to collect any leaks from their transport vehicles along the route to and from the construction sites.

- The solid waste that may come from the use - replacement of consumable materials falling under alternative management, such as tires of wheeled machinery, used batteries and accumulators, packaging materials of consumables, etc., should be collected and disposed of for recycling, in accordance with the requirements of the current legislation (Law 2939/01 and the decrees issued pursuant thereto).

- Non-hazardous solid waste (old spare parts, machinery, etc.) to be collected and removed. Their disposal should be carried out, in accordance with the provisions of JMD 50910/2727/03 (Government Gazette 1909/B).

- The collectors - transporters who will receive the above waste should be properly licensed according to the current legislation.

- Materials contaminated by hazardous waste, to be collected separately in special bins and made available to companies that have a relevant license for the management of hazardous waste, in accordance with Government Decree 13588/725/2006 (Government Gazette 383/B/06).

- The loading, transport and storage of products and sterile materials should be done in a way that avoids environmental pollution.

3.3. EFFECTS ON FAUNA SPECIES

The impacts from the construction of the Wind Farm are limited to the construction location of the wind turbines and the configuration of the access and connection roads of the W/Ts. Effects on fauna are studied during the construction phase and the operation phase.

3.3.1. Construction phase

- The construction works of the Wind Farm and the continuous anthropogenic presence during the construction period are expected to result in the disturbance of the species of fauna that include the construction sites in their habitat. During the construction of the works, there will be a partial displacement of fauna species from the construction sites. This implies that the places are not

used by fauna species. However, some nocturnal species with good adaptability to human presence (fox) will visit construction sites during the night in search of food scraps.

- The main disturbance to fauna species is related to the increased noise levels during the construction phase. The effect of sound on animal species causes the species to move away from the sound emission sites. This is a normal reaction to avoid danger. This displacement is partial, and does not cause significant effects on the biology of the species nor does it permanently affect the hearing of the fauna species.
- Along the course of the access works (road improvement) and at the locations of the W/Ts, no obvious active nests of large and medium mammal species were recorded and therefore there is no possibility of destroying the nesting sites for important species of the fauna. Hare and wild boar activity (biodegradable traces) was detected at the W/T sites. The construction of the project is not expected to significantly affect the activity of species that show good adaptation to anthropogenic activities and are mainly nocturnal.

3.3.2. Operation phase

During the operation phase there will be no significant impact on the fauna of the area. The noise emitted by the operation of the wind turbines is minimal and constitutes a nuisance that ranges at low levels and is of a similar level to noise emitted by low activity nuisances. The effect of sound on animal species causes the species to move away from the sound emission sites. This is a normal reaction to avoid danger. This displacement is partial, but related to the synergy of the effects of similar RES and their concentration, which in the wider area remains at a low level. The noise does not cause significant effects on the biology of the species nor does it permanently affect the hearing of the fauna species.

The operation of the farm does not cause emissions of pollutants or radiation to affect the fauna of the surrounding area.

Effects on bat populations

The recorded impacts on bats from the installation and operation of the Wind Farm according to the EU are as follows:

- Nuisance and partial displacement at the sites of activity. Changes in temperature, light, noise and vibrations near the nesting sites have a negative effect. At the site of the project, a small number of chiropractor species were recorded with correspondingly little activity and there are no sources for the existence of a nest-colony nearby.
- Impact

- Barrier effect
- Trauma — the deadly interaction between bats in flight and wind turbine structures
- Loss or displacement of flight paths and places of refuge — the physical or operational loss of flight paths and places of refuge.
- Increased availability of invertebrate prey and therefore increased risk of collision due to night lighting

Disturbance and displacement can occur at any stage during the project life cycle, with barrier effects occurring during operation and upgrading. These potentially significant impacts may result in changes in behavior, including attraction, spatial displacement of flight paths and exclusion of bats from foraging habitats they would otherwise use (Barré et al. 2018). Attraction could result in a higher risk of impact (Rydell et al. 2010, Voigt et al. 2018).

3.4. EFFECTS ON AVIFAUNA SPECIES

The installation and operation of an Wind Farm project has expected effects on the avifauna of an area, and therefore the assessment of the effects on the avifauna is particularly studied by preparing special ecological studies and considering the application of additional protection measures.

3.4.1. CONSTRUCTION PHASE

During the construction phase of the project, there will be disturbance to bird species, especially small ostriches and predatory species, which use the habitat as a feeding and nesting area.

The construction works will result in the partial and reversible displacement of some species from the construction area and the loss of the occupied area from their habitat during the works. This impact is not considered significant, as the surface of the habitat that will be lost is small and constitutes a minimum surface of the corresponding habitat used by the bird species in the wider area. The main nuisance during the construction phase is related to the increase in noise intensity from the use of construction site machinery and vehicles.

The area occupied by the project including the road construction works (improvements and openings) and the construction and installation squares of W/Ts amounts to 33.58 Ha , while within the boundaries of the SPA area no construction works for W/Ts is foreseen. Therefore, the occupation within surfaces of the NATURA 2000 network is 0%.

The interconnection line passes underground along existing roads and for a part of 430 m length from the NATURA 2000 area along a provincial road bridge that crosses Ardas River.

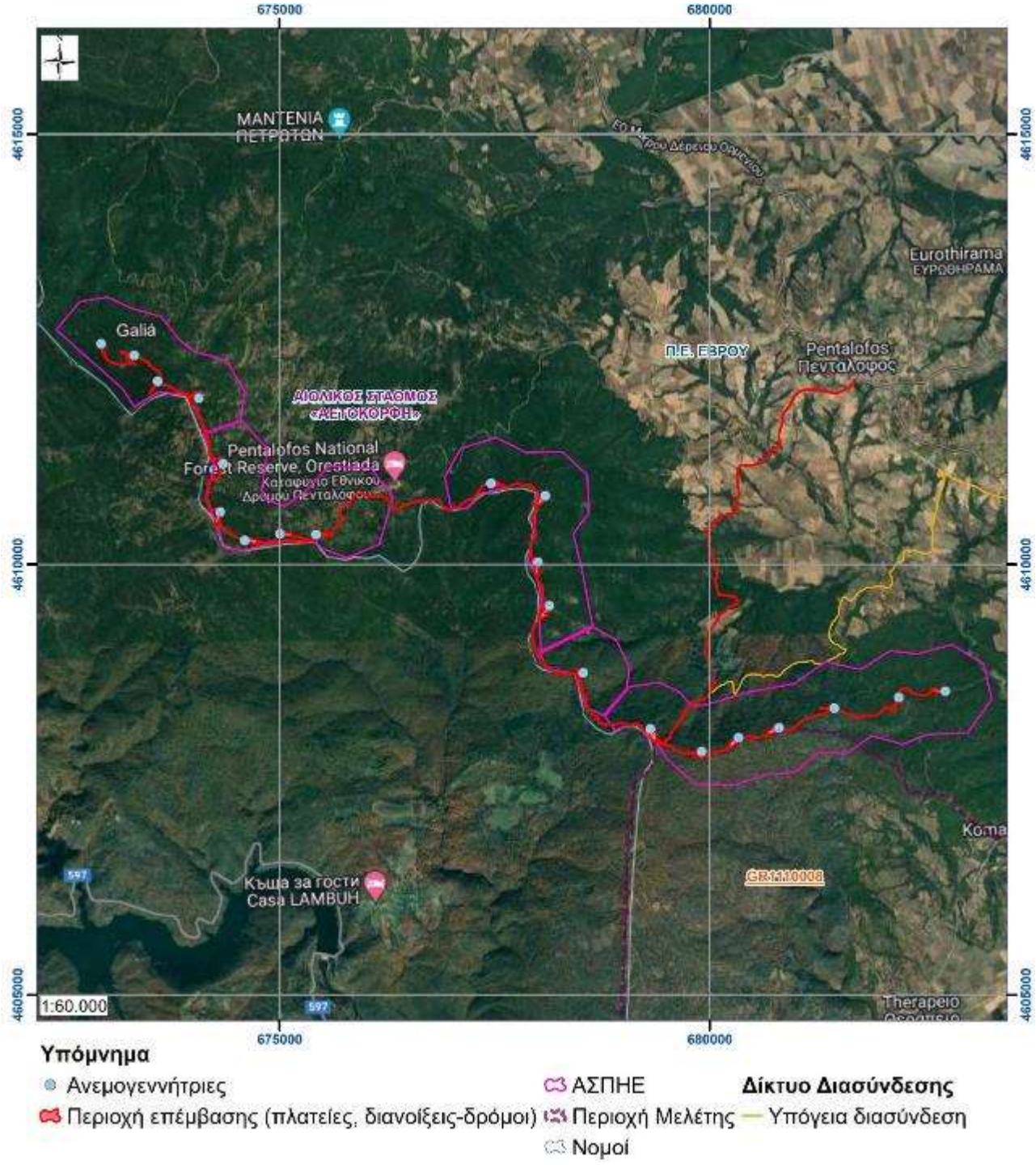

Figure 3-4 Intervention areas (squares, road improvements and construction section) of the project under study

3.4.1.1. DAMAGE TO NESTING PLACES

During the field work, no nesting sites have been recorded at the construction sites of the Wind Farm projects. From the "scanning" of the area, no damaged nests of important species were found. No nesting sites for bird species have been identified at the location of the W/Ts.

3.4.1.2. LOSS OF HABITAT

As a result of the installation of the wind farm, there will be a partial and small-scale loss of the feeding habitats of predatory species that usually hunt in the gaps of the forests but also in the stands of the forest (shrike, woodpecker, owl). The connection of the Wind Farm's wind turbines will be made mainly by existing forest roads and no extensive excavations will be made. Maintenance and expansion of the existing forest road network will be carried out. The impact is of a medium degree given the large area it occupies in relation to the foraging habitats of the area. As a result of the installation works of the wind farm, there will be no significant fragmentation of the bird habitats. After all, the phenomenon of fragmentation of biotopes - habitats of species occurs in cases of road projects of closed highways (eg EGNATIA ROAD) and not in small forest roads.

3.4.1.1. NOISE

During the construction phase of the Wind Farm there will be an increase in the noise level from the operation of vehicles and especially the excavation machinery. The level of stray noise will not rise to a significant level. **All the works are proposed to be carried out during the non-breeding period of the avian species, between February 15 and the end of April, so the effects of the works will not cause significant impacts on the birds during their period of intense activity**.

3.4.2. OPERATION PHASE

The effects of the operation of the Wind Farm concern displacement of species from the habitats they use. Another impact is the injury and death of bird species, such as the Stork (*Ciconia ciconia*), black stork (*Ciconia nigra*), of the Golden Eagle (Aquila chrysaetos), Eagle (Aquila pennata), of the Serpent Eagle (*Circaetus gallicus*), of Valtokirkos (*Circus cyaneus*), of Bufo (*Bubo bubo*), of Sfikiaris (*Pernis apivorus*), which are species that use the study area mainly as a foraging habitat.

During the operation of the Wind Farm, the noise produced by the W/Ts and the waves of which are transmitted through the ground, are a nuisance to the bird species that nest on the ground, in the bushes and in the forest floor. These are small-scale disturbances to which most species show adaptation. After all, on the one hand, the existing levels of noise emissions from the national and

provincial road network and the surrounding settlements are at the same levels as the emissions from the operation of W/Ts, and on the other hand, these are minor nuisances.

3.4.3. DANGERS FROM INFLUENCE ON THE MICRO CLIMATE

According to the literature, wind farms can influence wind speed and reduce it. At a distance of about 7d (7*150m) behind the W/Ts, the wind flow has again become laminar and speed has been restored, according to applied fluid mechanics.

The impact is considered negligible and there is no effect on the microclimate of the area.

3.4.4. IMMEDIATE LOSS OF HABITAT

The scale of direct habitat loss resulting from the installation of a wind farm and associated infrastructure depends on the size of the project and is generally considered to be small per wind turbine base and 2-5% of the total area (Drewitt & Langston 2006). Thus, immediate habitat loss is not considered a major threat to birds outside areas that have been designated (or meet the criteria to be designated) as nationally or internationally important for biodiversity, depending of course on local conditions and the extent required for the main and for accompanying projects (Council of Europe 2002, Langston & Pullan 2004).

In the Wind Farm under consideration, the loss of habitat is negligible, as there is already a large road density (forest road network).

3.4.5. COLLISION HAZARDS

The chances of collision depend on a range of factors related to the species of birds present, their number and behavior, weather conditions, the topography of each area and the shape of the wind farm. Clearly the risk is greater in or near areas commonly used by large numbers of birds for feeding and roosting, or on migration corridors and mass local movements of birds. Large birds that do not maneuver easily are generally more vulnerable to collisions with structures. Also species that are accustomed to flying at dawn and dusk or at night, are likely to find it more difficult to detect and avoid wind turbines (Larsen & Clausen 2002). Collision risk also varies within each species depending on age, behavior and stage of the annual cycle.

According to studies that have been prepared worldwide and used in the present study to assess the effects of the installation of the wind farm under study, the risks of impact concern both bird species found in the area and which can be estimated with relatively good accuracy, as well as in species that pass through the area (transient) in search of food and are not found in the area, in which case it is difficult to assess the probability of impact on the wind farm facilities. The impact risk

also applies to migratory birds, where it can also be estimated with relatively good accuracy. Below is a detailed description of collision risks and their causes based on literature data, accident records and scientific studies. Special references are made to the most sensitive species, such as predators and the sensitive species found in the area of the wind farm under study.

According to the analysis of collision accident records in wind farms worldwide, the highest values recorded were in coastal farms (Offshore windmills).

Electric shock, collision with electric cables (del Hoyo et al . 1992, Demerdzhiev et al. 2009, Gerdzhikov, Demerdzhiev 2009, Demerdzhiev 2014) and wind turbines (Manville 2005, Kostadinova, Gramatikov 2007, European Commission 2010) are among the most serious threats to the White Stork (*Ciconia ciconia*) during migration (Hancock et al. 1992). The problem with wind farms is big and worrying for Bulgaria, which as a recent member state of the EU is obliged to show significant progress in the development of the sector of renewable energy sources (Directive 2009/28/ EC of 23 April 2009 on the promotion of the use of energy from renewable sources).

Globally, but also in Greece, there is no meaningful correlation and comparison of the mortality estimation models requested by the services and agencies within the framework of the EIA and SEA in relation to the actual recorded mortality in the finally licensed and operating wind farms.

3.4.5.1.1. COLLISION ON WIND TURBINE BLADES AND TOWER

The effects of wind turbine towers appear to be minor, however kills have been recorded, both in endemic and migratory birds. According to measurements made, it was estimated that the average number of victims ranges from 0.04 to 0.09 birds per brood per day (Winkleman 1994, Erickson 2005). Of these, 43% of collisions were caused by birds that drifted and collided when flying dangerously close to the generator, 36% directly hit the generator, and the causes of death for the remaining 21% remained undetermined. According to Winkleman (1994) the total number of birds killed per 1000MW of wind energy is considerably lower than other causes of bird death related to human activities (telecommunication towers, pylons, etc.).

Although, as mentioned, both migratory and epidemic birds have been victims of collisions with wind turbines, the total number of migrants remains small. Birds typically during migration fly at altitudes greater than 150 meters, higher than the average altitude of a generator, given that the type of W/T in the project under consideration is VESTAS V162-6.2MW reaches a total height of 149 m .

As far as epidemic birds are concerned, the greatest mortality was observed in raptors.

There are several reasons that justify the fact that birds collide with wind turbines, one of the most important and most obvious is that they cannot locate the towers of the wind turbines. For this fact, two assumptions can be made regarding this difficulty in predators:

The spot or curtain of movement. It is caused by the dimming of the visibility of fast moving objects.

The inability of raptors to separate their attention between hunting their prey and monitoring their flight horizon, when downwind, for the presence of any obstacles.

Regarding the second, it is almost improbable that birds of prey cannot simultaneously focus on the ground and the horizon, as their eyes have bilateral vision, one for forward vision and one for downward vision (Hodos et al. 2001).

Motion blur appears to be the main reason why raptors cannot distinguish wind turbine blades during days with good visibility. The motion blur is more intense at the bladetips where the speed is higher. According to studies, a very good and satisfactory method to solve the problem **is the coloring of the blades with fine lines which are visible to the birds** (Hodos et al. 2001).

During days with adverse weather conditions it has been observed that it is difficult for any raptors in flight to distinguish the wind turbine impeller. **Therefore, it is recommended to stop their operation under conditions of dense fog and low visibility.**

There are estimates that the noise emitted by the wind turbine at the height of the turbine acts as a deterrent and warning to predatory species which thus avoid approaching the wind turbines.

According to a bird observation study with cameras at a Wind Farm in the Tarifa region of Spain over a period of 14 months, it was observed that the majority of birds changed their flight path when flying within the area where the wind turbines were located, compared to the rest of the open areas. Nesting sites were also recorded within the perimeters of the wind farms of several species including:

Anthus pratensis, Saxicola torquata, Oenanthe hispanica, Bubo bubo, Carduelis carduelis

A species that is very sensitive to interventions and has been displaced from the habitats it uses, for the last ten years, is the Asproparis. The Asproparis (*Neophron percnopterus*), is found in only three regions in Greece, one of them is Epirus. It nests in cavities or rock crevices and in wooded areas. It is almost omnivorous and feeds on the carcasses of small animals. Direct killing by humans and the use of poisons to combat harmful species are considered to be among the main causes of the species' decline.

In many researches and studies the issue of active avoidance of W/Ts by birds is highlighted, assessing the degree of perception of the existence of W/Ts and their avoidance (Smallwood & Thelander 2005). Whitfield & Madders (2006) studying the White Circus (*Circus cyaneus*) report

that the avoidance rate was 99%. Similarly de Lucas et al. (2004) studying the behavior of birds approaching the W/Ts of three (3) wind farms in the Gibraltar area, report that 72% of the birds perceived the W/Ts and changed direction, while when the W/Ts were in mode the avoidance rate was even higher. Of course, as already mentioned, most studies show that the largest percentage of avian species' flights are performed outside the danger zone in the rotor sweep area (Nelson & Curry 1995, Osborn et al. 1998, etc.).

The exact circumstances of his injury are under investigation.

The main factors that influence and determine the probability of impact in W/T:

- The arrangement of wind turbines
- The features of the relief of the area
- The particular climatic conditions that prevail
- The mode of flight according to each species
- The usual directions of the course of each species
- The mode of passage of the species (swarms or groups)
- The parallel activity of searching and hunting for food while passing through the wind farm
- The frequency of presence in the Wind Farm area and the degree of use of the space

According to the study of the Hellenic Ornithological Society of Greece for the year 2010 "Identification and mapping of the ornithologically sensitive areas of the wind farms in Greece" (Dimalexis et al., 2010), the species of avifauna which have been characterized as particularly sensitive and vulnerable to RES have been recorded , the degrees of impact are also evaluated by the types of impacts or other more specific factors. Of these species, common to those recorded in the context of this study are the following:

Aegypius monachus, Gyps fulvus, Aquila pennata, Aquila chrysaetos, Circaetus gallicus, Circus aeroginosus, Circus cyaneus

At this point we must mention that the mortality estimates mentioned in relevant studies and agency reports and made using models and not by recording actual mortality with the application of records, appear significantly increased in relation to the actual mortality records worldwide

3.4.5.1.2. COLLISION ON NETWORK CABLES

In wind farm installations, collision and electrocution of birds with electric cables is possible. Birds that fly fast in compact flocks and at low altitudes, such as waterfowl, are more susceptible to wire collisions. Also predators are often victims of the cables.

In the facilities of the wind farm under study, all the cables will be placed in trenches underground along the internal roads. In this way, the possibility of a bird hitting overhead cable networks is zero.

The connection of Wind Farm to the network is proposed to be made at the existing substation (S/S) of Orestiada. The proposed 33kV medium voltage underground line of the interconnection will have a total length of approximately 36.24km and will be built along existing roads.

Alternatively, the connection to the grid could be made in a new 33/150kV Substation in the routing zone of the KYT NEAS SANTAS – ORESTIADAS transmission line, with an underground medium voltage line, with a total length of approximately 35.63 km.

3.4.5.1.3. IMPACT TO THE FACILITIES DUE TO THE LIGHTS

Aviation warning lights are placed on all tall structures, as they must be visible to people from the air. Therefore birds that have similar visual acuity to humans, are able to see the lights that attract them. One hypothesis for what mainly attracts migratory birds to the lights is that they perceive the red warning lights of the towers as stars and try to maintain a constant direction relative to them. As a result, they approach the structures in a spiraling motion and eventually collide with them.

It is believed that the number of birds killed each night depends on local weather conditions and the number of birds, with mass deaths usually occurring during adverse weather conditions such as fog, low cloud and thunderstorms. According to Elkins (1988) the combination of refraction and reflection of emitted light by raindrops and mist droplets in the air increases confusion and disorientation for migrating songbirds.

Much research has been carried out on the mechanisms and causes of the attraction of birds to lights, but the phenomenon has not yet been fully explained. **However, it is clear from the international literature that no mass deaths have been observed or reported at wind farms, and no bird deaths at such facilities have been attributed to generator lights.**

The US Fish and Wildlife Service recommends that only white or red lights be used on towers at night and that they maintain a minimum number of flashes. Red pulse lights should be avoided as they confuse migrating birds (USFWS 2000).

The wind turbines carry all the necessary warning lights (red and white) according to the latest specifications and rules of safe Aviation

3.4.5.2. EXPECTED EFFECTS DURING THE OPERATION PHASE AT THE "AETOKORFI" Wind Farm .

As already clarified and understood from the results of the analyzed studies, the estimation of bird mortality in planned wind farm installations is extremely difficult and uncertain as it depends on many local factors, species behavior, species abundance and location of the installations which will affect avian species in a different way.

Estimates of mortality can only be made in wind farms during their operation and after recording and finding carcasses over a period of at least one year.

An important factor and factor of the average expected mortality is the abundance of bird species and the species that live in the wider area.

Based on the composition and abundance of bird species in the area, the technology of the wind farm and the local conditions, **no higher mortality is expected than the average mortality recorded on a global scale and in Greece in the Wind Farm at the Aetokorfi site. Experience from recordings in operation of wind farms worldwide that show similar characteristics to the Wind Farm under consideration (wind turbine technology, location, habitat, relief and bird species), showed a reduced mortality of the order of 0.2 birds per wind turbine per year and in particular for predators 0.03 birds per wind turbine per year.**

In a study done in Germany by the Working Group of German State Bird (LAG VSW), regarding the proposed distances of wind turbines from bird habitats, it is estimated that, for the White Stork, the main foraging areas can be protected by maintaining a minimum distance of 1,000 meters between nesting sites and wind turbines. A verification range of 2,000 m around the nest is recommended to account for additional foraging areas (especially meadows and pastures).

Regarding the risk of nesting within the W/T site, the wind turbine towers in the Wind Farm under study consist of a single and solid tower and do not allow birds to roost and nest, as was the case with the old-technology latticed metal constructions.

Danish Wind Industry Association (2001) on the results of Danish wind farm studies reports that the tallest wind turbines were avoided by birds during their flights and there were no significant collision rates.

In the study area, the degree of impact on the bird species recorded in the context of the present study for the priority species (predators and species of the annex i of the JMD E.P.37338/1807/ E103 (Government Gazette 1495B/6-9-2010) is analyzed below.

The degree of impact per impact category was determined with a practice-based approach on a global scale and was based on the frequency of recording and mainly flight in the vicinity of the Wind Farm under study. In the context of the study, the following grades were determined:

✓ 0 : A 0 was scored for the type of effect estimated to have an insignificant to minimal effect

✓ 1: The type of effect estimated to have some effect (visible or measurable effect) but this will be small and acceptable, i.e. it will have an effect but will not change the current status of the species in the area, not even directly nor in the long run

✓ 2 : With 2 the type of effect was rated that it was estimated that there is an equal chance of having or not having an effect, but if it does, these effects are characterized as moderate

✓ 3 : With 3 was rated the type of effect that was estimated to be quite likely to have a significant effect with a negative result such as e.g. the gradual reduction of the population of the species in the area

✓ 4 : A 4 was scored for the type of effect that was estimated to be very likely to have a significant effect with a decisive negative effect

✓

Table 3-1 : Assessment table of the degree of impact from the operation of the Wind Farm "Aetokorfi" on the bird species recorded in the area

N/A	SPECIES	Presence status	Red Book of Birds of Greece	JMD E.P. 37338/1807/ E103	SPEC	TYPE OF IMPACT				
						LOSS OF IND/TOS	DISPLACEMENT	FLIGHT INTERFERENCE	IMPACT	Assessment using prevention systems
						DEGREE OF IMPACT				
1	*Ciconia nigra*	μΦ3/M3/X4	**EN**	I	2	0	0	**3**	**2**	1
2	*Ciconia ciconia*	MF2	**VU**	I	2	1	2	**3**	**3**	1
3	*Microcarbo pygmeus*	EF3	**LC**	I	1	1	2	0	0	0
4	*Gyps fulvus*	eΦ3/Φ4	**VU**	I	4	1	1	2	2	1
5	*Aegypius monachus*	eΦ4	**EN**	I	1	1	1	2	2	**1**
6	*Aquila chrysaetos*	εΦ3	**EN**	I	3	1	1	1	2	1
7	*Clanga pomarina*	M	**EN**	I	2	1	1	1	**2**	1
8	*Circaetus gallicus*	μΦ2/M2/X4	**NT**	I	3	1	1	1	2	1

N/A	SPECIES	Presence status	Red Book of Birds of Greece	JMD E.P. 37338/1807/ E103	SPEC	TYPE OF IMPACT				
						LOSS OF IND/TOS	DISPLACEMENT	FLIGHT INTERFERENCE	IMPACT	Assessment using prevention systems
						DEGREE OF IMPACT				
9	*Aquila pennata (Hieraaetus pennatus)*	eΦ3/M2/X4	**EN**	I	3	1	1	1	2	1
10	*Milvus migrans*	ε+μΦ3/ξ3/M2-[M2]	**CR**	I	3	1	1	1	2	**1**
11	*Circus aeruginosus*	e+mf3/X1/M1	**VU**	I	4	1	1	**3**	**3**	
12	*Circus cyaneus*	X2/M2	**NE**	I	3	1	1	**3**	**3**	
13	*Buteo buteo*	εΦ2/X1/M1	**NE**	-	4	0	0	0	2	1
14	*Pernis apivorus*	μΦ3/M2	**LC**	I	4	0	0	0	2	1
15	*Accipiter nisus*	eΦ2/X2/M2	**NE**	-	4	0	0	0	1	**0**
16	*Accipiter brevipes*	μΦ2/M3-[t]	**NE**	I	2	0	0	1	1	0
17	*Falco tinunculus*	εΦ1/M2	**NE**	-	3	0	0	1	2	1
18	*Falco peregrinus*	εΦ2/X2	**LC**	I	4	0	0	1	1	0
19	*Falco columbarius*	X3/M4	**NE**	I		0	0	1	1	0
20	*Falco subbuteo*	μΦ3/M3-[M2/Φ4]	**NE**	-	4	0	0	0	1	**0**
21	*Columba palumbus*	εΦ3/X2-[εΦ/X2]	NE	-	4	0	0	0	1	0
22	*Streptopelia turtur*	MF2	NE	II/2	3	0	0	0	0	0
23	*Cuculus canorus*	μΦ2/M2-[M2/Φ4]	NO	-	4	0	0	1	1	0
24	*Strix aluco*	EF	NE	-	4	0	0	1	1	0
25	*Bubo bubo*	εΦ1	**LC**	I	3	0	0	1	1	**1**
26	*Otus scops*	e+MF1	NE	-	2	0	0	1	1	1
27	*Caprimulgus europaeus*	μΦ2/M3-[μΦ2/M2]	LC	I	2	0	0	0	0	0
28	*Apus apus*	MF	NO	-	4	0	0	0	0	0
29	*Merops apiaster*	μΦ3/M2-[μΦ3/M1]	NE	-	3	0	0	0	0	0
30	*Coracias garrulus*	MF3	NE	I	2	0	0	0	0	**0**
31	*Upupa epops*	εΦ2/M2	**NE**	-	3	0	0	0	0	0
32	*Picus viridis*	εΦ2	NE	-	**2**	0	0	0	0	0
33	*Dendrocopos medius*	εΦ2	**LC**	I	-	0	0	0	0	**0**
34	*Dryocopus martius*	εΦ3	**LC**	I	-	0	0	0	0	0
35	*Dendrocopos syriacus*	εΦ2	**NE**	I	4	0	0	0	0	0
36	*Alauda arvensis*	EF3	NT	-	3	0	0	0	1	**1**
37	*Galerida cristata*	EF1	NE	-	3	0	0	0	0	0
38	*Calandrella brachydactyla*	μΦ3/M2-[μΦ4/M2]	NE	I	3	0	0	0	0	0

N/A	SPECIES	Presence status	Red Book of Birds of Greece	JMD E.P. 37338/1807/ E103	SPEC	TYPE OF IMPACT				
						LOSS OF IND/TOS	DISPLACEMENT	FLIGHT INTERFERENCE	IMPACT	Assessment using prevention systems
						DEGREE OF IMPACT				
39	*Melanocorypha calandra*	EF3	**VU**	I	3	0	0	0	0	**0**
40	*Lullula arborea*	εΦ1/X2	**LC**	I	2	0	0	0	0	0
41	*Hirundo rustica*	μΦ1/M1	**NE**	-	3	0	0	0	0	0
42	*Delichon urbicum*	MF	NE	-	3	0	0	0	0	**0**
43	*Motacilla cinerea*	μΦ3/Φ2/M3-[Φ2/M3/Φ4]	NE	-	4	0	0	0	0	0
44	*Motacilla alba*	EF2	NE	-	4	0	0	0	0	0
45	*Anthus campestris*	μΦ3/M2	**LC**	I	3	0	0	0	0	0
46	*Anthus pratensis*	X1	NE	-	4	0	0	0	0	**0**
47	*Troglodytes troglodytes*	εΦ2/X2-[εΦ2]	NE	-	4	0	0	0	0	0
48	*Erithacus rubecula*	εΦ2/X1/M2-[X1/M3]	NE	-	4	0	0	0	0	0
49	*Phoenicurus ochruros*	εΦ2/X1/M2-[X2/M2]	NE	-	4	0	0	0	0	0
50	*Phoenicurus phoenicurus*	μΦ3/M2-[M1]	NE	-	2	0	0	0	0	**0**
51	*Saxicola rubetra*	εΦ3/M1-[M1]	NE	-	4	0	0	0	0	0
52	*Saxicola rubicola*	εΦ2/X2/M3-[X1/M3]	NE	-	4	0	0	0	0	0
53	*Oenanthe oenanthe*	μΦ2/M1-[M1]	NE	-	3	0	0	0	0	0
54	*Turdus pilaris*	eΦ4	**NO**	II/2	4	0	0	0	0	**0**
55	*Turdus philomelos*	εΦ3	**NO**	II/2	4	0	0	0	0	0
56	*Turdus merula*	εΦ1/X1	**NE**	II/2	4	0	0	0	0	0
57	*Iduna pallida*	μΦ1/M2-[μΦ1/M4]	NO	-	-	0	0	0	0	0
58	*Hippolais olivetorum*	MF3/M4	NT	I	4	0	0	0	0	**0**
59	*Sylvia communis*	MF2	NE	-	4	0	0	0	0	0
60	*Sylvia melanocephala*	MF	NE	-	4	0	0	0	0	0
61	*Phylloscopus trochilus*	M1	**NE**	-	4	0	0	0	0	0
62	*Phylloscopus collybita*	eΦ3/X1/M2	**NE**	-	4	0	0	0	0	**0**
63	*Muscicapa striata*	μΦ2/M1	**NE**	-	3	0	0	0	0	0
64	*Ficedula semitorquata*	μΦ3/M3	**DD**	I	2	0	0	0	0	0
65	*Parus major*	εΦ1/X2	**NE**	-	4	0	0	0	0	0
66	*Cyanistes (Parus) caeruleus*	εΦ1	**NE**	-	4	0	0	0	0	**0**
67	*Poecile (Parus) palustris*	εΦ3	**NO**	-	3	0	0	0	0	0

N/A	SPECIES	Presence status	Red Book of Birds of Greece	JMD E.P. 37338/1807/ E103	SPEC	TYPE OF IMPACT				
						LOSS OF IND/TOS	DISPLACEMENT	FLIGHT INTERFERENCE	IMPACT	Assessment using prevention systems
						DEGREE OF IMPACT				
68	*Poecile lugubris*	εΦ2	**NO**	-	-	0	0	0	0	0
69	*Lanius collurio*	μΦ2/M1	**NE**	I	3	0	0	0	0	0
70	*Lanius senator*	MF2/M2	**NE**	-	2	0	0	0	0	**0**
71	*Lanius minor*	MF3/M3	**NT**	I	2	0	0	0	0	0
72	*Garrulus glandarius*	εΦ1	**NE**	II/2	4	0	0	0	0	0
73	*Corvus corone*	εΦ1	**NE**	II/2	4	0	0	0	0	0
74	*Corvus monendula*	EF1	**NE**	II/2	4	0	0	0	0	0
75	*Corvus corax*	εΦ2	**NE**	-	4	0	0	0	0	0
76	*Sturnus vulgaris*	EF3/X1	**NE**	-	3	0	0	0	0	**0**
77	*Fringilla coelebs*	eΦ1/X1/M3	**NE**	-	4	0	0	0	0	0
78	*Carduelis (Linaria) cannabina*	eΦ2/X2/M4	**NE**	-	2	0	0	0	0	0
79	*Carduelis carduelis*	eΦ1/X2/M4	**NE**	-	4	0	0	0	0	0
80	*Chloris chloris*	eΦ1/X2/M4	**NE**	-	4	0	0	0	0	**0**
81	*Emberiza melanocephala*	MF2	**NE**	-	2	0	0	0	0	0
82	*Emberiza cirlus*	εΦ2	**NE**	-	4	0	0	0	0	0

Impact rating : *0: Negligible 1 : Very low 2: Low 3: Moderate 4: High 5: Very high*

In particular, the protection measures concern all the species that were recorded in the field work and that are included in Appendix I of the JMD E.P. 37338/1807/ E103 (Government Gazette 1495B/6-9-2010), and those that constitute the characterization species of the SPA area with code GR1110008 – (Riparian forest of northern Evros and Ardas), which are the Vulture (*Dendrocopos syriacus*), the cinderella (*Lanius minor*), the night crow (*Nycticorax nycticorax*) and the cormorant (*Phalacrocorax carbo sinensis*).

The Black Stork (*Ciconia nigra*): It was recorded a total of 11 times in one- and two-person flights and on three occasions in a standing position in a stream bed and at a distance from the W/T positions. The activity of the species was recorded in high-altitude flights of 100 - 200 m but also descents in gullies and canals. The usual activity was at a distance from the project site mainly to the north and east in the Ardas river bed, and in ravines and canals in the wider area .

The frequent activity of the species in the area and the flights it performs from feeding sites in streams and canals to nesting sites pose risks of collision with the blades and towers of the W/Ts. The use of DtBird system or Digisec is an important method of preventing collision of the species.

The Stork (*Ciconia ciconia*): It was recorded repeatedly from March to September. The species nests in artificial and natural nests in and near settlements and uses the agricultural lands of the region for foraging. Typical flights include movements from the nests to the agricultural and barren areas where they forage and return to the nests to carry food to the chicks. From observations and from the data of the online database Movebank where the flights of the species are recorded, flights of the species were recorded over the project location.

The use of a DtBird or Digisec system is an important method of preventing species impact.

The Lagona (*Microcarbo pygmeus*): Recorded twice in June in an irrigation canal east of the Wind Farm and in the Komara dam lake. The species uses the riparian areas, streams and irrigation canals of the region as its habitat. Movements of waterfowl individuals to and from these locations on water surfaces with flights over rural locations are frequent. The activity of the species is mainly located in the riparian areas and in the irrigation canals and there is little activity of crossings from the sites of the projects, in cases of movement between the water systems.

The Vulture (*Gyps fulvus*) : Recorded a total of 4 times throughout the year. Records included flights as high as 200 m. Vulture individuals were recorded mainly in two-person flights but also in single-person flights. The species does not use the area of the projects as a habitat but is a transitory species during its movements from the colony of Dadia to the colony in the area of Bulgaria. The species has a permanent presence in the wider area of Dadia and its activity is increased mainly to the south and west of the project location and the crossings from the Wind Farm location are clearly less frequent than in the areas west and south of the projects. The use of the Wind Farm area is not frequent and no stands or perches near construction sites were recorded. The importance of the species and its strict protection regime must be taken into account and, therefore, important measures are proposed to protect and reduce the effects of the construction and operation of the wind farm. **The site of the projects is located outside the zone of increased protection and exclusion proposed by the WWF in 2013 and outside the limits of the areas - zones of distribution of the species according to the study by Vasilakis** . According to LIFE program vulture telemetry data VULTURE and the available data of the Movebank website regarding the vulture population in Bulgaria, the usual flight paths of the two vulture species **are NOT located in the area of the Wind Farm projects under study, but are located mainly in the wider area demarcated between Soufli and Aisymi with direction from NW to SE.**

The use of Dt Bird or Digisec system is an important method of preventing collision of the species. Also, it is proposed to be vigilant and inform the management and operation staff of the Wind Farm so that there is a constant check for finding carcasses of wild or livestock animals, which must be removed in order to avoid the attraction of carrion-eating species (vultures and black vultures).

The black vulture (*Aegypius monachus*): Recorded a total of 8 times throughout the year. The recordings mainly included flights at a distance from the project sites at a high height above the ground. In three recordings it passed close to W/T positions of the Wind Farm under study.

LIFE program vulture telemetry data VULTURE and the available data of the Movebank website regarding the vulture population in Bulgaria, the usual flight paths of the two vulture species **are NOT located in the area of the Wind Farm projects under study, but are located mainly in the wider area demarcated between Soufli and Aisymi with direction from NW to SE.**

Similarly to vulture, the use of DtBird or Digisec system is an important method of preventing collision of the species. Also, it is proposed to be vigilant and inform the management and operation staff of the Wind Farm so that there is a constant check for finding carcasses of wild or livestock animals which must be removed in order to avoid the attraction of carrion-eating species (vultures and black vultures).

The Golden Eagle (*Aquila chrysaetos*): The species was recorded a total of twelve times. The flights were made at a relatively high altitude and at a distance from the positions of the wind turbines of the wind farm, the flights were recorded mainly west and southwest of the wind farm. We consider that the species nests at a distance from the location of the Wind Farm and the use of the Wind Farm area by it is limited, as it is not its habitat. The use of Dt Bird or Digisec system is an important method of preventing collision of the species.

The Kravgaetos (Clanga pomarina): It was recorded thirteen times in flights in the wider area. The wider wetland area of the Ardas and Evros water streams is the habitat of the species as well as the area to the west in the area of the artificial lake Ivaylovgrad in the Bulgarian territory. The species does not nest near the project and was not recorded at other times. The use of Dt Bird or Digisec system is an important method of preventing collision of the species.

The Fidaetos (*Circaetus gallicus*) : It was recorded in a number of observations in the wider area of the projects in foraging flights, display and standing in trees. Many flights were recorded near W/T construction sites of the Wind Farm under study. In addition to the records of the species, we mention the existence and recording of a large number of reptiles (snakes) which are the main type of food of the Serpent Eagle. The frequent presence and importance of the species must be taken into account for further records by implementing the proposed monitoring program. The use of Dt Bird or Digisec system is an important method of preventing collision of the species.

The Gerakaetos (*Aquila pennata*): Recorded twenty one (21) total times in flights of a mature male individual. Recorded on feeding flights. The activity of the species in the location of Wind Farm

is frequent mainly in the west and NW. The presence of a large number of micro-birds in the project area increases its incidence. The frequent presence and importance of the species must be taken into account for further records by implementing the proposed monitoring program. The use of Dt Bird or Digisec system is an important method of preventing collision of the species.

The Tsiftis (*Milvus migrans*): Recorded four times during migration in flight and perched in close proximity to works. The area of the projects on the perimeter of wetland ecosystems increases the probability of occurrence by flight and simply passing through the location of the projects. The use of Dt Bird or Digisec system is an important method of preventing collision of the species.

The Kalamokirikos (Circus *aeruginosus*): It was recorded in a number of measurements mainly in the east and north around the Evros and Ardas rivers and in agricultural crops. The Kalamokirkos uses the area of fields and riparian lands. for foraging, as it was recorded in a number of measurements in the agricultural areas looking for food. The use of Dt Bird or Digisec system is an important method of preventing collision of the species. The species, together with the winter grebe, uses the lowland areas to the east and north of the project sites as a foraging site.

The Chimonokirikos (*Circus cyaneus*): recordings were made in flights at a distance from the Wind Farm sites during the November - February measurement period. It was found in the area of agricultural crops. The use of Dt Bird or Digisec system is an important method of preventing collision of the species.

The Saini (Accipiter *brevipes*): Recorded once in flight from perch to tree and in flights at a distance from the site of the works. The species is characterized by an energetic and very flexible flight and it is estimated that it is not at great risk of impact with the structural elements of the W/T.

The Gidovizi (*Caprimulgus europaeus*): Heard 3-5 times at a distance from the works. There were no visual observations. The use of Dt Bird or Digisec system is an important method of preventing collision of the species.

The Chalkokourouna (*Coracias garrulus*): Recorded in numerous single-person records in flight and perching on trees and wires. The recordings were made between May and August. The impact of the construction and operation of the works on the species is considered small.

The Balkan Woodpecker (*Dendrocopos syriacus*): was recorded several times throughout the wooded area of Aetokorfi. There is activity of the species in the area of the works and, as mentioned, the pre-construction investigation to locate nesting sites in hollow trees along the access works is

proposed in order to minimize the impacts during the reproductive period and the period of incubation and rearing of the chicks.

The Microgaliandra (*Calandrella brachydactyla*): It is found in the wider lowland area, and in the agricultural lands. Recorded during the summer months. It is estimated that there will be no impact on the species. Given that, on the one hand, the projects are being built at a distance from the agricultural and grassland areas that constitute the habitat of the species, and the construction work will be done outside the breeding season, the impacts during the construction phase will be significantly reduced.

The Dentrostarithra (Lulula arborea): It is estimated that there will be no impact on the species. Given that the construction works will be done outside the breeding season, the impacts during the construction phase will be significantly reduced.

The Liostristitida (Hippolais olivetorum): Recorded 3-4 times in solitary bushes and 2 individuals. The main threats to the species are not related to RES projects and it is estimated that there will be no significant impact on the population of the species from the construction and operation of the wind farm. Given that, on the one hand, the projects are being built at a distance from the agricultural and grassland areas that constitute the habitat of the species, and the construction work will be done outside the breeding season, the impacts during the construction phase will be significantly reduced.

The Aetomachos (*Lanius collurio*): The species does not face any danger from the operation of the wind farm. Given that the construction works will be done outside the breeding season, the impacts during the construction phase will be significantly reduced. The probability of encountering W/T is considered negligible for the species, as its flights are restricted to low altitude outside the scanning area of W/Ts, and normal activity occurs in bushy and wooded areas.

The Stachtokefalas (*Lanius minor*): was recorded in perching positions and flying near the works. Given that the construction works will be done outside the breeding season, the impacts during the construction phase will be significantly reduced. The probability of encountering W/T is considered negligible for the species, as its flights are restricted to low altitude outside the scanning area of W/Ts, and normal activity occurs in bushy and wooded areas.

No active nests of the high-risk predatory species were recorded at the site of the Wind Farm under study, and this significantly reduces the impact of the project on their population. The possibility of impact for these species is a potential risk which is reduced or eliminated by taking the proposed measures, both during the construction and during the operation of the wind farm.

Regarding the habitats of terrestrial species and micro-birds in the study area, the effects are expected to be limited. Disturbances during the construction period could possibly affect the above

species. Due to the landscape of the wider area, the small scale intervention for access works using existing forest roads the landscape form is not expected to be greatly affected. There is no risk of fragmentation of habitats, as the works of improvement, opening and construction of squares concern forest roads and surfaces, which remain everywhere accessible for fauna and bird species. There will be no changes in the foraging process, or the wintering of the species as the forested environment of the project sites will be affected to a small extent. **It is proposed that the entire construction work of the project be done outside the breeding season, ie from mid-February to the end of April** .

It is pointed out that the recorded flights and their evaluation as high risk (passing at a distance of 350 m from the W/T) is an estimate which is subject to an error against an accurate estimation of the flight distance and, on the other hand, took place in the absence of the W/T, an event that will change the landscape and affect the flight and transit patterns of the species recorded in the project area. Therefore, the high-risk flights are indicative of potential risk and not absolute data that can be attributed after the installation of the project and in the context of a monitoring program.

The installation and use of W/T approach deterrents and especially the W/T Collision Avoidance System with audible signals and W/T shutdown will significantly reduce the chance of blade or tower impact.

The depicted high-risk flights in picture 2.3 concern predatory species and species included in Annex I of the JMD E.P.37338/1807/E103.

All recorded flights within the zone with a radius of 350 m from the location of each wind turbine were classified as high risk flights. This distance is generally considered a zone of increased risk for the following reasons:

i . It is the average distance between the W/T towers of the Wind Farm allowing a free distance between the blades of the W/T, which is a relatively short distance for a large sized bird passing between the W/Ts and within which it is difficult the execution of evasive maneuvers.

ii . It is the safe distance from the base of the W/T to the surface of the ground where high gradients appear (canyon, cliff,) where large predators are used to wind using thermal currents.

iii . The distance of 350 m is the safe radius outside which a large raptor or vulture can achieve up to 98% avoidance of a collision course.

The overestimation of the number of records as high-risk flights results from the addition to them of flights of predators which were estimated at a height above the ground of 180 m, which is the movement zone of the blades of the W/T and up to a height of 200 m .

In total for all predator species the high-risk flights based on the distance of 350 m from the tower of each W/T according to the recorded trajectories as they emerged from the field work, including those where the flight height was estimated at more than 200 m, amount to 28.

As for their classification based on the size of the species, the 15 flights concern the following species:

- One Black Vulture flight (1 person in flight up to 200 m 11/4/2021).
- Four Fidaetos flights made at a height of 200 m from the ground
- Three Golden Eagle flights made at a height of 200 m
- Three Falcon flights made by one person at a height of 150 m
- One flight of an individual Black Stork made at a height of 80 m
- Three flights of Gerakina 1 and two people at a height of up to 150 m

The smallest species of avifauna are the following:

- Four flights from Brachokirkinezo at heights from the ground 0-100 m .
- Four flights from Xefteri at a height of 10-100 m
- Flights of crows, stachtokouroune and stachtares

The above medium and small-sized birds are characterized by a very skillful and energetic flight which contributes to the easy (compared to larger birds) execution of evasive maneuvers at a shorter distance from obstacles. Therefore, it is considered that with the existence of W/Ts, there will be a possibility of avoidance in a high percentage.

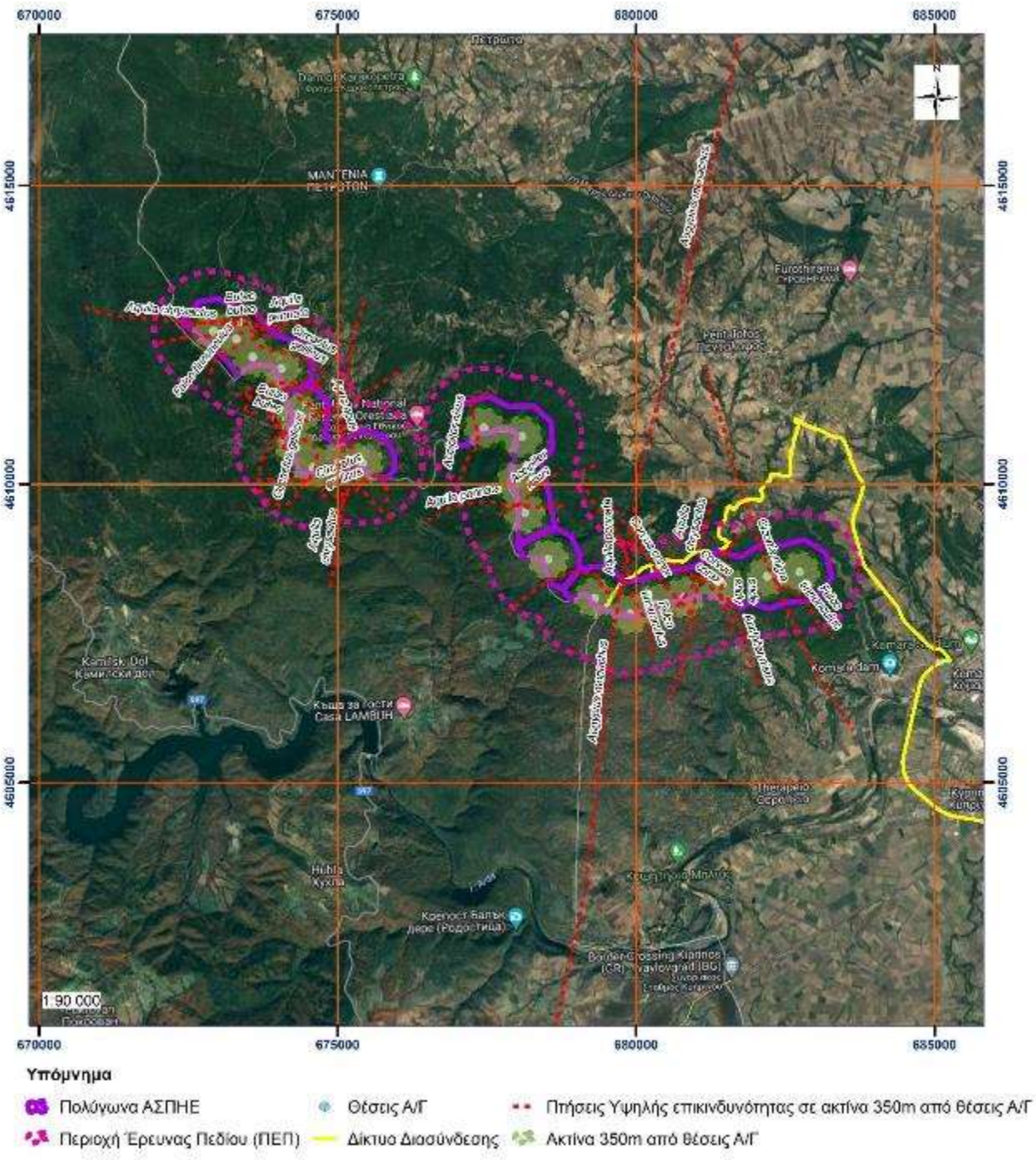

Figure 3-5: The usual flights of avian species within the high risk zone for the studied Wind Farm (R =350 m) from W/T sites as recorded by the fieldwork.

The radius of movement of the blades of each W/T is 81.00m with a total diameter of 162m and a surface covered by the movement of each W/T in 20,601.54 sq.m (20.60 acres). According to the flight records in the project area if we consider that in the radius of 90m the potential impact for bird species in 6 flights is as follows:

- Two Fidaetos flights made at a height of 150 m from the ground
- One Gerakaetos flight made by one person at a height of 100 m
- One flight of an individual Black Stork made at a height of 80 m
- One flight to Brachokirkinezos from a perch up to a height of 60 m
- A flight of Stachtara

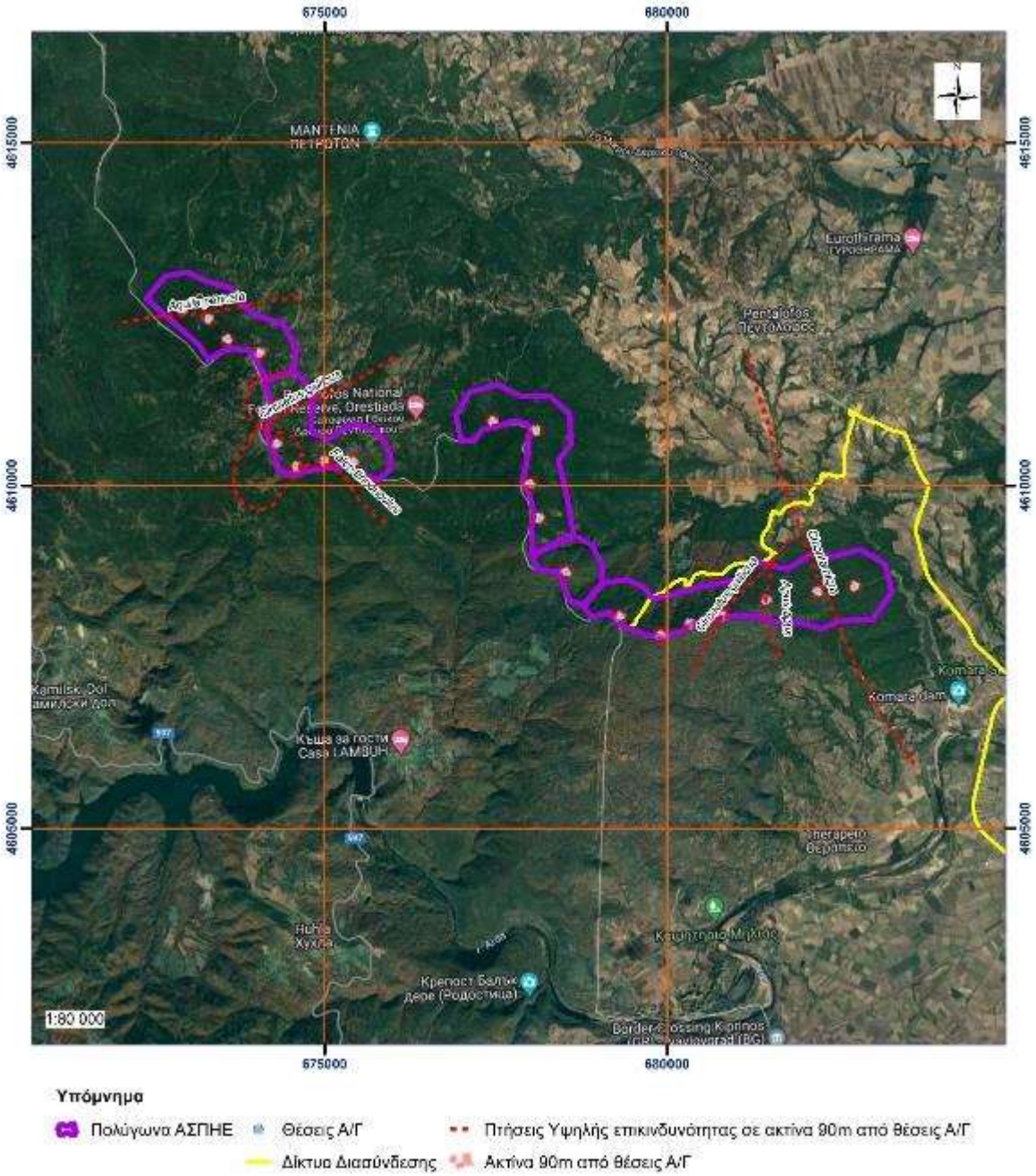

Figure 3-6: The typical flights of avian species within the impact zone for the studied Wind Farm (R =90 m) from W/T sites as recorded by fieldwork.

3.4.5.3. ASSESSMENT OF IMPACT RATE AT AETOKORFI wind farm - COLLISION RISK ANALYSIS

The BAND model (Scottish Natural Heritage 2000, 2006, 2010, Band 2007, Band 2012) was used to estimate the expected number of W/T blade collisions based on field measurements. The assessment of the impact rate was made for all twenty-two (22) W/T of the wind farm.

Using the Band Model , the expected W/T collision risk is calculated in three stages taking into account a variety of factors as follows:

- Stage 1: estimate the number of birds likely to collide per time period, i.e. the number of individuals crossing the rotor
- Stage 2: estimate the probability of an avian species colliding the blades of a W/T when passing through the field survey area or the total sweep volume of the W/T's blades.
- Stage 3: an avoidance rate is applied as a correction factor for the results of Stage 1 and Stage 2. This is included because a number of individuals either avoid, as a result of displacement, the Wind Farm under study, or fly higher or lower than the high impact risk zone (HIZ) with the blades, or finally possibly performing evasive maneuvers inside the Wind Farm to avoid the wind turbines.

The analysis and estimation of the impact rate with the application of the Band model was done for the types of characterization of the SPA area with code GR1110008.

For the assessment of the above characteristics, the phenological data for the above species were used which were drawn from the Greek and international literature (Glutz von Blotheim et al. 1971, Cramp & Simmons 1980, Bruderer & Boldt 2001, Dunning, JB1993, Pennycuick , C . J. 1999)

Table 3-2: Morphological characteristics of bird species recorded in the study field

N/A	Scientific name	Length (m)	Weight (Kgr)	Wingspan (m)	Wing Surface (m^2)
1	*Gyps fulvus*	1.05	7.00	2,600	0.9889
2	*Aegypius monachus*	1.10	9.00	2,725	0.9588
3	*Aquila chrysaetos*	0.85	4.40	2,120	0.5237
4	*Circaetus gallicus*	0.65	1.70	1,900	0.4058
5	*Hieraaetus pennatus*	0.48	0.80	1.105	0.2004
6	*Clanga pomarina*	0.62	1.30	1,465	0.5153
7	*Buteo buteo*	0.49	1.00	1,205	0.2404
8	*Accipiter brevipes*	0.56	0.90	1,300	0.2364

9	*Accipiter nisus*	0.32	0.20	0.625	0.0700
10	*Falco subbuteo*	0.35	0.22	0.870	0.0950
11	*Falco tinunculus*	0.36	0.21	0.755	0.0684
12	*Falco peregrinus*	0.40	0.80	1,025	0.1328
13	*Falco columbarius*	0.28	0.70	0.920	0.1215
14	*Ciconia nigra*	1.00	3.00	1,500	0.2842
15	*Ciconia ciconia*	1.00	3.07	1,600	0.5808
16	*Pernis apivorus*	0.56	0.90	1,300	0.2364
17	*Milvus migrans*	0.50	0.83	1,700	0.2805
18	*Circus aeruginosus*	0.60	0.83	1,700	0.2805
19	*Circus cyaneus*	0.60	0.83	1,700	0.2805

Speed and behavior for each species was estimated from the world literature (Pennycuick, CJ 1999, Bruderer, B. & Boldt, A. 2001,) and with the help of the FLIGHT 1.5 program (Pennycuick 2008). For each species, the minimum (min) and maximum (max) speed of cross-country gliding flight was calculated speed using best glide , in m / sec) at a flight altitude of about 300 m , which is considered as the average height of activity of most birds.

Thus the flight speeds (minimum and maximum) used for the recorded species are as follows:

Table 3-3 : Average flight speed of avian species processed in Band modeling

Species	Vmean (m/sec)
Gyps fulvus	7.28
Aegypius monachus	7.28
Aquila chrysaetos	7.7
Circaetus gallicus	7.45
Hieraaetus pennatus	7.75
Clanga pomarina	7.25
Buteo buteo	8.48
Accipiter brevipes	7,975
Accipiter nisus	7.45
Falco subbuteo	7.65
Falco tinunculus	7.1
Falco peregrinus	12.1
Falco columbarius	9.8
Ciconia nigra	9.75
Ciconia ciconia	9.1
Pernis apivorus	7,975
Milvus migrans	11.5
Circus aeruginosus	9.7
Circus cyaneus	7.5

To analyze the impact risk and for irregular flight activity, which characterizes most species and especially raptors, it is necessary to calculate the time in which the birds flew towards the total recording time which amounted to 15,000min. The visible surface of the FRA from the vantage points (VP) covers 100% of the W/T construction sites and covers the FRA at a rate of 85%.

Volatile hazard volume (Vw in m^3) was calculated at 138,510.00m^3 for the wind farm. The collision hazard volume or blade sweep volume for one W/T was calculated for a rotor with a diameter of 162m and an additional peripheral zone of 25m.

From the available field measurements, the stay n in hours per year of the specific bird species in the Wind Farm area and the time in which each species is predicted to pass through the Collision Risk Height (CRH) were estimated.

For the assessment of the flights within the CRH due to the impossibility of accurately measuring the flight height and the exact distance from the scan zone of the W/T, as this is only achieved using Radar and telemetry using transmitters in the avian species, all flights were included of the specific species at a distance of up to 200m from the W/T positions and with a flight height of up to 300m as well as flight data obtained from the routes posted on the internet for the vulture, black vulture (Life Vulture, Vultures Return in Bulgaria) and stork (LifeTrack White Stork Greece Evros Delta). In this way, the attempt was made to better assess and avoid the underestimation of the risk.

From the processing of the field data the average total number of crossings of people from the CHR zone per hour of observation is shown in diagram 2-1.

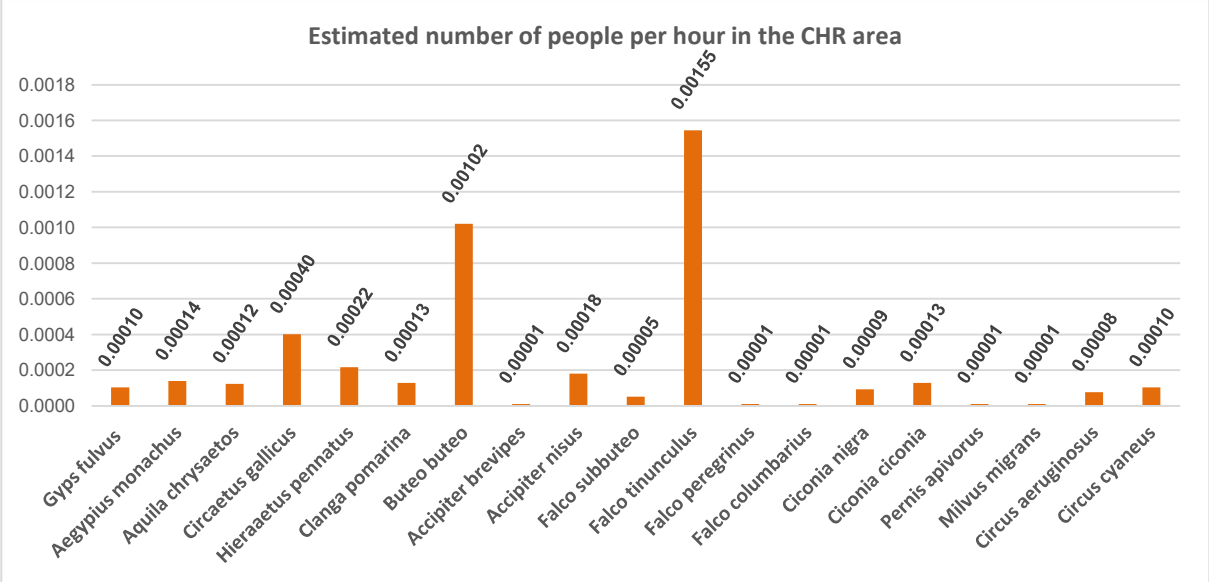

Diagram 3 1. The average time of observation in the CHR zone by species at Wind Farm Aetokorfi for the measurement period.

The number of expected passages (T) from the CHR zone of the rotor of each W/T and also in total for the Wind Farm under study was calculated from the relationship:

$$T = b/t \quad (1)$$

Where, b = the bird's stay in the bladespan volume

$$b = n * (V_r / V_w) \quad (2)$$

t = the time the species passes the rotor using low or high speed gliding (Table 2-4)

n = the species' stay in the wind farm

According to the above and with the data of the records for the species under consideration, the number of expected crossings (T) from the CHR zone per rotor per year is as follows:

Table 3-4 : Data used to estimate the expected bird crossings in the rotor's CHR zone, with low and high flight speed at the Wind Farm Aetokorfi under study

Scientific name	V_w (m^3)	Vr (m^3)	Vm (m/sec)	NUMBER OF PASSES FROM THE W/T SCANNING AREA PER YEAR (individual/YEAR)
Gyps fulvus	138510	2119898.47	7.28	7.0270
Aegypius monachus	138510	2141530.08	7.28	9.4864
Aquila chrysaetos	138510	2033372.00	7.70	8.9188
Circaetus gallicus	138510	1946845.53	7.45	20.1925
Hieraaetus pennatus	138510	1873298.03	7.75	18.8512
Clanga pomarina	138510	1933866.56	7.25	6.2982
Buteo buteo	138510	1877624.36	8.48	116.6890
Accipiter brevipes	138510	1907908.62	7.98	0.5542
Accipiter nisus	138510	1804076.86	7.45	18.1215
Falco subbuteo	138510	1817055.83	7.65	2.6583
Falco tinunculus	138510	1819218.99	7.10	148.0296
Falco peregrinus	138510	1838687.45	12.10	0.8409
Falco columbarius	138510	1786771.56	9.80	0.6811
Ciconia nigra	138510	2098266.85	9.75	4.0656
Ciconia ciconia	138510	2098266.85	9.10	6.5878
Pernis apivorus	138510	1907908.62	7.98	0.4619
Milvus migrans	138510	1881950.68	11.50	0.6660
Circus aeruginosus	138510	1925213.91	9.70	4.6814
Circus cyaneus	138510	1925213.91	7.50	4.3436

Then, the probability of a bird hitting the blades of the W/T of the Wind Farm under study, when it passes through the area of the blades, was estimated (Band 2007). This probability is influenced by a number of factors related to the technical characteristics of the wind turbine (blade chord width, rotor diameter, blade rotation speed, blade pitch angle) and some biological characteristics of the species (length, wingspan, flight speed). Thus two collision probabilities with the blades of the W/T were calculated, one for low and one for high flight speed according to W . Band (2007). The sheets for calculating the probability of impact with the Band model are included in appendix III of this study. According to the impact probability calculations with the Band model are listed in table 2-5.

Table 3-5 : Calculation of probability of impact on the blades of the W/T according to the Band model

Species	HIGH FLIGHT SPEED	LOW FLIGHT SPEED
	Band (%)	Band (%)
Gyps fulvus	6.70%	27.00%
Aegypius monachus	6.80%	27.70%
Aquila chrysaetos	6.10%	18.70%
Circaetus gallicus	5.80%	16.40%
Hieraaetus pennatus	5.20%	12.80%
Clanga pomarina	5.50%	20.70%
Buteo buteo	4.70%	14.70%
Accipiter brevipes	5.10%	7.80%
Accipiter nisus	4.70%	13.40%
Falco subbuteo	5.10%	11.50%
Falco tinunculus	5.30%	11.50%
Falco peregrinus	4.50%	7.30%
Falco columbarius	5.20%	12.60%
Ciconia nigra	6.20%	20.10%
Ciconia ciconia	5.00%	11.80%
Pernis apivorus	5.10%	16.20%
Milvus migrans	5.00%	14.20%
Circus aeruginosus	5.20%	15.20%
Circus cyaneus	5.10%	15.30%

In the last three stages, the expected number of collisions = kills per species and year is estimated, taking into account the factor of the daily time of W/T. Specifically, we consider that W/Ts during the day operate for 25% of the daily time, due to:

i . Very low or correspondingly very high wind speed

ii . Due to scheduled maintenance or repair. Therefore the probability of impact is reduced to 75% of the initial estimated value (W. Band , Madders , D. P. Whitfield 2007) .

Finally, according to the world literature (W. Band, Madders, DP Whitfield 2007, Erickson et al., 2001, Joris Everaert 2014, Cook et al. 2012) the collision avoidance factor must be taken into account, as the vast majority of birds tend to act to avoid impact. The degree of collision avoidance must be estimated for each species separately, a task that is very difficult in practice. According to the literature, in 95% of flights, birds perform collision avoidance maneuvers. This clearly greatly reduces the potential mortality.

According to the above corrections, the expected number of crossings through the CHR zone for the species under consideration is listed in table 2-4, taking into account the 75% reduction in impact due to non-operation of W/Ts and in a separate column the avoidance factor which receives the value 95%

According to the global literature, as already mentioned, it appears that the mortality assessment made using models, based mainly on the characteristics of the birds and the frequency and number of records, shows very large deviations in relation to the actual mortality from W/T in operating wind farms. Specifically, according to Whitfield 2019 the recorded mortality in a wind farm of 60 W/T in Bulgaria for species of interest was zero in the period 2010-2017, in relation to estimates made for the same W/Ts by the Bulgarian Ornithological Society based on the use of assessment models mortality.

M . Ferrer (2011) who in an wind farm in the Tarife area , where of course a very high mortality was recorded due to wrong location within a vulture core, in 20 Wind Farms with a total of 252 W/T in the period the variation of actual deaths for vultures was 150.5% and predators 212.8%.

BAND models to estimate expected mortality is required by the appropriate review and approval agencies of the studies, and we believe that in addition to overestimating mortality rates, they are subject to similar errors as those recorded in the global literature in the correlation of estimated mortality in EIAs and SEAs in relation to the actual recordings in operating wind farms. Correlation with a linear relationship between frequency of observed birds and mortality, leads to erroneous conclusions about expected mortality.

Of course, it should be mentioned that for the estimation of the expected mortality due to collision, the data obtained from recordings that took place in ideal lighting conditions and without visual observation data on days with dense fog, due to the inability to visually locate birds, have been used.

In order to minimize the possibility of striking birds under these conditions, it is recommended to install thermal detection cameras and stop the operation of the W/Ts in conditions of dense fog or low cloud cover, with the simultaneous use of the special lights to identify the position of the W/Ts.

Vultures, eagles, storks and cicadas are at greatest risk of collision. **From the records of the individuals wearing a GPS transmitter , there is NO significant number of passes over the location of the wind farm, and individual low frequency random passes are recorded.**

According to research by the Norwegian Institute for Nature (Norwegian Institute for Nature Research) the effectiveness of detection systems using cameras was estimated at 59-80%. The relevant table estimates the expected mortality using the above systems with a 50% reduction of the estimated value from the band model .

Table 3-6: Estimate of expected bird strikes on the rotor of the W/T of the Wind Farm under study

Species	Band (%)			NUMBER OF BIRDS OF PASSAGE/YEAR	NUMBER OF COLLISIONS	Estimated years to kill 1 person without estimating avoidance rate and reduction due to daily operating rate of W/Ts	75% Impact probability INDIVIDUALS/YEAR	Avoidance Rate (%)	Expected collisions per year (including avoidance rate)	Estimated years to kill 1 person	Estimated collisions using Dt Bird or DIGISEC systems
	HIGH FLIGHT SPEED	LOW FLIGHT SPEED	Average								
Gyps fulvus	6.70%	27.00%	16.85%	7,027	1,184	0.845	0.888	95.00%	0.0444	22.5217	0.0222
Aegypius monachus	6.80%	27.70%	17.25%	9,486	1,636	0.611	1,227	95.00%	0.0614	16.2959	0.0307
Aquila chrysaetos	6.10%	18.70%	12.40%	8,919	1.106	0.904	0.829	95.00%	0.0415	24.1123	0.0207
Circaetus gallicus	5.80%	16.40%	11.10%	20,192	2.241	0.446	1,681	95.00%	0.0841	11.8975	0.0420
Hieraaetus pennatus	5.20%	12.80%	9.00%	18,851	1,697	0.589	1,272	95.00%	0.0636	15.7176	0.0318
Clanga pomarina	5.50%	20.70%	13.10%	6,298	0.825	1,212	0.619	95.00%	0.0309	32.3207	0.0155
Buteo buteo	4.70%	14.70%	9.70%	116,689	11,319	0.088	8,489	95.00%	0.4245	2.3560	0.2122
Accipiter brevipes	5.10%	7.80%	6.45%	0.554	0.036	27,973	0.027	95.00%	0.0013	745.9494	0.0007
Accipiter nisus	4.70%	13.40%	9.05%	18.121	1,640	0.610	1,230	95.00%	0.0615	16.2602	0.0307
Falco subbuteo	5.10%	11.50%	8.30%	2,658	0.221	4,532	0.165	95.00%	0.0083	120.8621	0.0041
Falco tinunculus	5.30%	11.50%	8.40%	148,030	12,434	0.080	9,326	95.00%	0.4663	2.1446	0.2331
Falco peregrinus	4.50%	7.30%	5.90%	0.841	0.050	20,156	0.037	95.00%	0.0019	537.4801	0.0009
Falco columbarius	5.20%	12.60%	8.90%	0.681	0.061	16,497	0.045	95.00%	0.0023	439.9301	0.0011
Ciconia nigra	6.20%	20.10%	13.15%	4,066	0.535	1,870	0.401	95.00%	0.0200	49.8790	0.0100
Ciconia ciconia	5.00%	11.80%	8.40%	6,588	0.553	1,807	0.415	95.00%	0.0208	48.1893	0.0104
Pernis apivorus	5.10%	16.20%	10.65%	0.462	0.049	20,330	0.037	95.00%	0.0018	542.1266	0.0009
Milvus migrans	5.00%	14.20%	9.60%	0.666	0.064	15,640	0.048	95.00%	0.0024	417.0729	0.0012
Circus aeruginosus	5.20%	15.20%	10.20%	4,681	0.478	2,094	0.358	95.00%	0.0179	55.8458	0.0090
Circus cyaneus	5.10%	15.30%	10.20%	4,344	0.443	2,257	0.332	95.00%	0.0166	60.1893	0.0083

3.4.6. OTHER NUISANCE

3.4.6.1. NOISE

During the field work (25 days) no days with systematically high noise levels were observed. In the wider area, there have been noise disturbances for years due to man-made activities in the surrounding settlements and rural areas.

During the construction work of the project there will be an increase in emitted noise levels within the prescribed limits of the legislation. During the operation phase of the station, as analyzed by the relevant noise study, the emission limits will fluctuate at very low levels.

3.4.6.2. DISPLACEMENT

The phenomenon of partial displacement due to the loss of feeding habitat and the occupation of the living space used by the bird species from the W/T squares and the surfaces of the accompanying projects is a reversible effect which, overall, is not considered significant for the majority of species. In the Wind Farm under study, the effects will be limited, as the positions of the W/T are located almost entirely along the existing forest road which has an increased (compared to other forest roads) traffic load due to its position along the border line Greece - Bulgaria.

The use mainly of the existing road reduces interventions on wooded surfaces for the formation of squares and slopes.

Displacement may also be caused by the use of camera detection and approach prevention systems, as the sound signals emitted are an obvious nuisance to bird species, which nevertheless constitutes a very important mitigation measure of a more significant impact, that of impact.

According to the world literature, the phenomenon of displacement is multifactorial and depends beyond the construction data of the Wind Farm on the species of birds, the habitat, etc. The results of the studies are to a large extent ambiguous, as is also the case for collision risk assessment studies (Marques et al 2021).

According to the study Marques et al 2021 in which an evaluation of a total of 71 studies assessing the displacement effect was made useful conclusions are drawn per bird family. As it turns out, the greatest impact of the phenomenon of displacement is faced by the species of swimming birds, geese, pelicans, ornithomorphs and eagles.

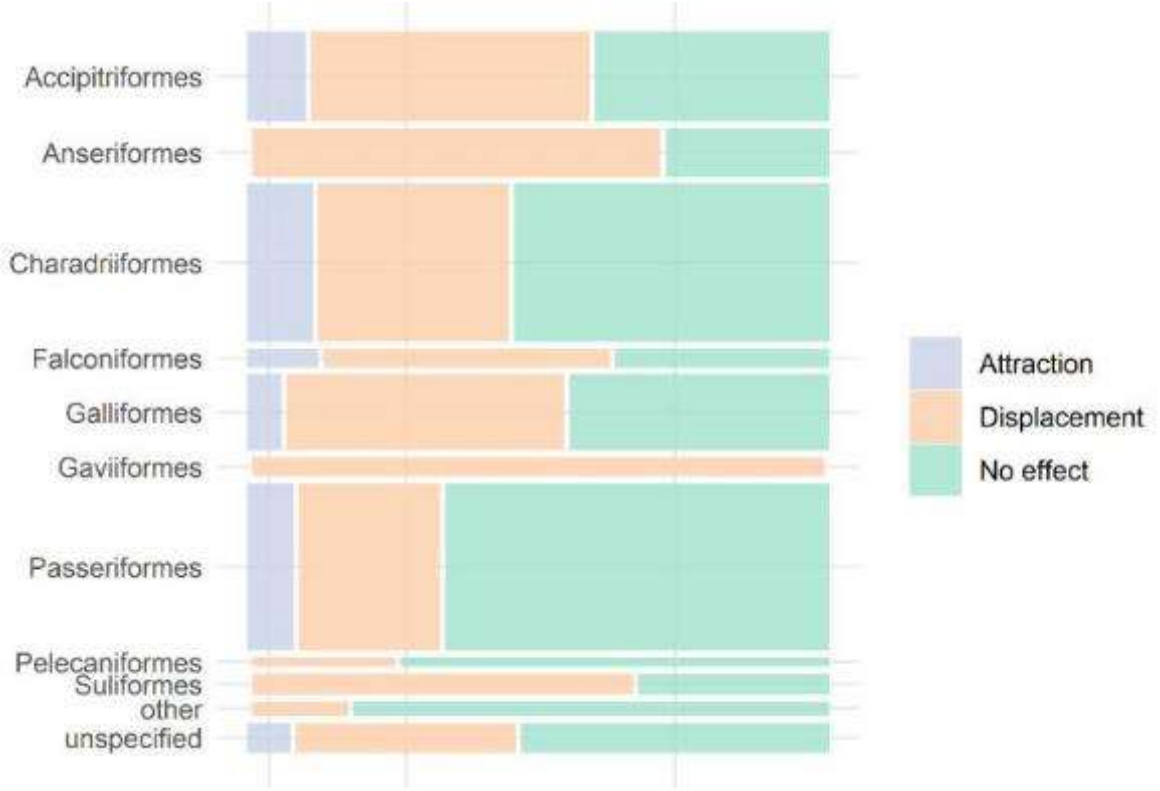

Diagram 3.2. The effect of displacement, attraction and no effect by bird order (Marques et al 2021).

3.4.6.3. OBSTRUCTION OF FLIGHT – BARRIER

This type of effect is accounted for together with synergistic effects from neighboring wind farms. The species that were recorded in flight and perching near the Wind Farm concern birds with excellent ability, but different acceleration and reaction time. Large raptors flying at the blade sweep height of W/Ts will experience a significant drag effect and will be forced to consume energy reserves in order to avoid the area covered by the blade sweep.

The W/Ts of the Wind Farm under study will have a significant scanning surface (blade movement) as the occupied diameter is 162 m . According to the map of RAE and the planned Wind Farm projects, the concentration of RES in the study area is small and a continuous line of obstruction of the flight horizon is not created, maintaining significant surfaces between the projects. In figure 2.5, the RES projects of the wider area in relation to the project under study.

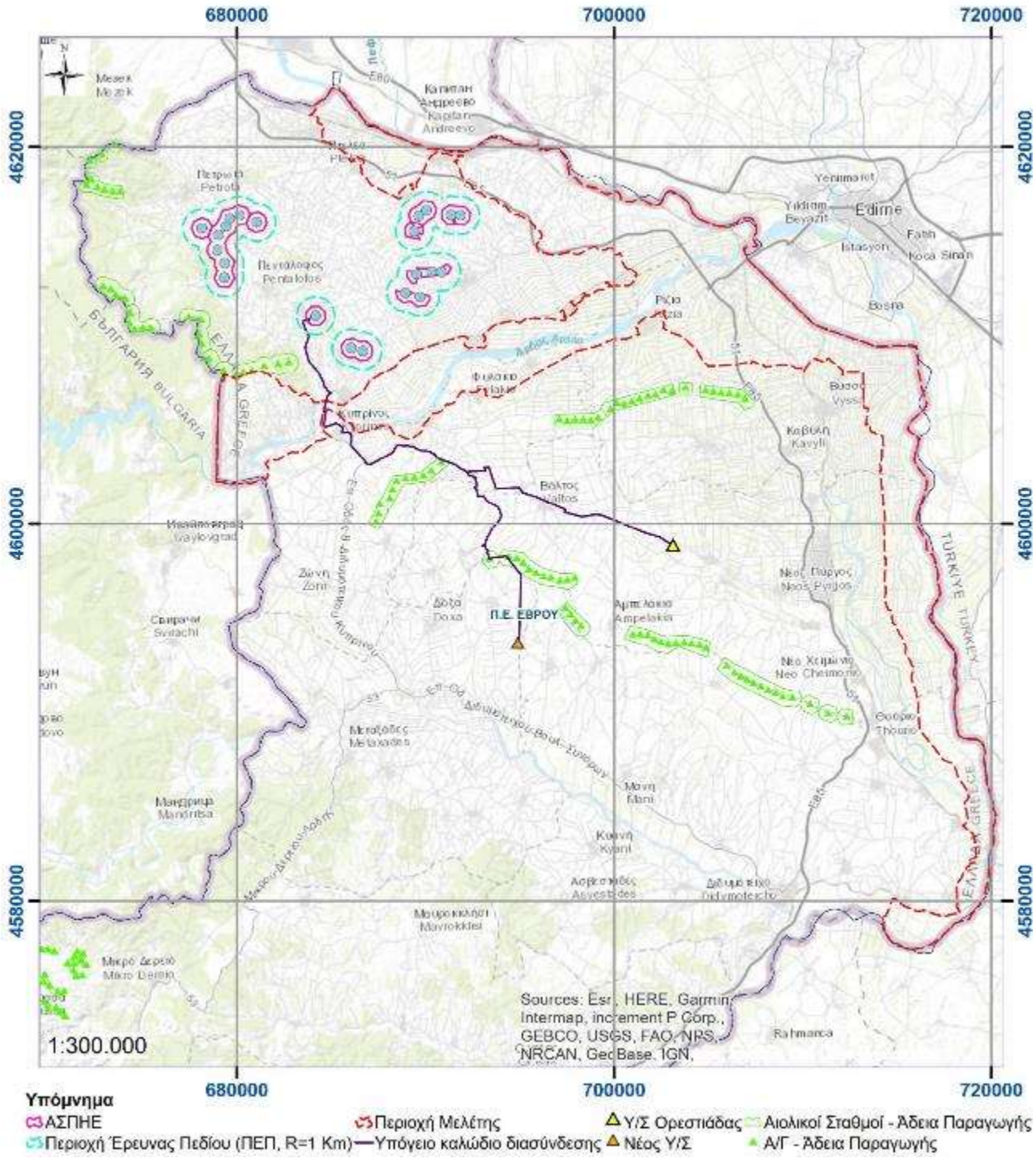

Figure 3-7 The positions of the W/T of the Wind Farm and the W/T of the nearest wind farm.

3.4.6.4. EFFECT ON MIGRATION PASSAGES

The number and species of migratory birds at a migration site depends to a large extent on the migration routes of the species, which are formed by factoring in the ideal thermal conditions that

prevail at the appropriate time of year. Birds either avoid sea crossings altogether or cross the narrower passages, thus creating migratory congestion (Bildstein 2006).

Variation in migration timing and routes from year to year could also be determined on an individual basis by external factors (such as food availability), as demonstrated in the study by Berthold et al. (2004).

A migratory species which is estimated to be affected to some extent by the establishment of the Wind Farm under study, is the stork. The stork appears in Greece early, in spring, late April to early March, breeds and returns to Africa in September. One reason Storks depart in September for their migratory journey to Africa is the good weather conditions, such as low rainfall and high air temperatures.

In a study by the Bulgarian Academy of Sciences for a local wind farm, the following is observed. The number of records of white storks at 300 meters above the ground as well as of other birds flying below 300 meters above wind turbine sites was significantly lower than the number of storks flying above non-turbine sites (Zehtindjiev, P., Biserkov, V., Biserkov, J., Fiedler, W., 2021). In addition, birds flying at altitudes of up to 300 m above ground level increase flight height near wind farms. The observed increase is gradual and depends on the density of the wind turbine blades on the ground. In the same study, 266 recordings were made near wind turbines. Within these 266 recordings the average distance to the nearest wind turbine blade was 385 m, (min = 26 m, max = 1171 m, std=233). There were also four sightings of a White Stork flying within 50 meters of the wind turbine, although it is not known whether the turbine rotor was spinning or not. **According to the study, the existing wind farms appear as a barrier, but do not seem to have a significant barrier effect. Storks avoid wind farms and ensure safe flight areas without large-scale deviation in the migration path.**

According to the results of several studies it has been shown that many migratory and wintering birds have modified their flight paths in order to avoid wind turbines (Danish Wind Industry Association 2001, Dirkson et al. 2000, Mossop 1998, Winkleman 1994).

Also, several studies done in Denmark in which the flights of birds were monitored by radar systems, both during the day and at night, showed that the birds had a tendency to change their flight path 100-200 meters before approaching the wind turbines and eventually passing at a higher altitude than them at a safe distance (Danish Wind Industry Association 2001).

Although birds seem to avoid flying near the wind turbines, the presence of these structures does not deter birds from their foraging areas. Many species even modify their usual landing and feeding areas at distances greater than 100 m from wind turbines (Danish Wind Industry Association 2001). Also, the reproductive capacity and productivity of birds has not been shown to be affected by wind farms as many have been observed nesting very close to wind turbines (Percival 2000).

The result of changing migration routes and local flyways is also a form of displacement. The phenomenon is called the Barrier effect and is considered a nuisance to the birdlife due to the possibility of exhaustion of the birds when they have to cover longer distances to avoid the wind turbines. In addition, the difficulty of finding new places for the birds to forage, perch, rest and reproduce is taken into account. Several studies recorded waterfowl that in flight avoided wind farms at a distance of 100 to 3000 meters from the wind turbines that were in their path.

The location of the wind farm under study is located near the wider zone of the main migratory passage from north to south. We believe that the position of Wind Farm will not cause significant effects on migratory species, based on the literature data and the number of observations that took place at the research level, but also in relation to the general behavior of the species during the field work in the FRA.

3.4.6.5. Impacts of the installation of the project on important bird species

In the study area, the degree of impact on priority species of avifauna (raptors and species of Annex I of JMD E.P.37338/1807/ E103 (Government Gazette 1495B/6-9-2010) is analyzed below.

In particular, the protection measures concern all the species that were recorded in the field work and that are included in Appendix I of the JMD E.P. 37338/1807/ E103 (Government Gazette 1495B/6-9-2010) and those that constitute the characterization species of the SPA area with code GR1110008 – (Riparian forest of northern Evros and Ardas), which are the Vulture (*Dendrocopos syriacus*), the Crested (*Lanius minor*), the Night Cormorant (*Nycticorax nycticorax*) and the Cormorant (*Phalacrocorax carbo sinensis*).

The Balkanotsiklitara (*Dendrocopos syriacus*): The species mainly uses habitats of deciduous and coniferous riparian forests. It feeds on bark-eating and wood-eating insects and nests in trees. Individually it is observed in trees, on the borders of cultivated areas and in peri-urban forests. **We estimate that the effects will be small and transient on the appearance of the species in the Field Research Area.**

The Stachtokefalas (*Lanius minor*): The species is common at the location of the wind farm and in the wider area. It nests in trees located in open areas. Its feeding and breeding habitat is open lowland areas at the borders of cultivated land and its feeding habits include insects, lizards, to small rodents and birds. **We estimate that the negative impacts will be small, as it is estimated that the species is not at risk of impacting the W/T's blades or tower and as the nesting and foraging habitats are reduced to a minimum.**

The Nichtokorakas (*Nycticorax nycticorax*): The species prefers areas with shallow fresh water and rich vegetation on the banks. It is nocturnal, feeding mainly on fish and then on insects, worms, rodents

and lizards. Nests in the fork of a low tree. **It is estimated that there will be no impact on the appearance of the species, as the project area does not fall within its habitats.**

The stork (*Ciconia Ciconia*), a species that was also analyzed in a previous chapter based on literature and observations in the context of writing corresponding studies on the effects caused by wind farms. After arriving in the area, which is in the spring, the stork breeds and the need for food is increased. It builds its nests in high places, churches, poles and usually uses the same nests every year. The stork's feeding habitat is riparian meadows, where it feeds on small amphibians, and fields, where rodents are an important source of protein.

During field measurements, a significant number (up to 200 individuals) were recorded in the June period in search of food in fields after harvesting, which reinforces the importance of protecting the area. The impact is estimated to be negative in the case of construction of the facility during the breeding season, with an impact on the reduction of the population. **The impact from the construction will not be negative if it takes place outside the arrival and reproduction period** . In addition, it is important that the facilities are at least 1.00-2.00 km away from the nesting sites of the individuals of the species, as after the birth, the flights to feed the chicks by the parents usually take place within a radius of 1.00-3, 00 km . The distance is recommended to avoid impact of the adults, in case of incorrect estimation of the distance on the part of the bird that is probably exhausted from the effort to care for the chicks (1-5 chicks, of which 0-4 survive).

It is pointed out that the recorded flights and their evaluation as high risk (passing at a distance of 350 m from the W/T) is an estimate which is subject to an error in the accurate estimation of the flight distance and, on the other hand, took place in the absence of the W/T an event that will change the landscape and affect the flight and transit patterns of the species recorded in the project area. Therefore, **the high-risk flights are indicative of potential risk and not absolute data that can be attributed after the installation of the project and within the framework of a monitoring program.**

The installation and use of W/T approach deterrents and especially the W/T Collision Avoidance System with audible signals and W/T shutdown will significantly reduce the chance of a blade or tower collision.

3.5. ANALYSIS OF COLLISIONS - THREATS OF THE STUDY AREA ACCORDING TO THE BULLETIN OF THE AREA OF THE NATURA 2000 NETWORK, FOR THE SPA GR 1110008

In the official bulletins of the NATURA 2000 area with code GR 1110008 the recorded positive and negative impacts and threats according to the specifications are listed in the table below.

Table 3-7. Impacts – threats as recorded in the official bulletins of the NATURA network area GR 1110008

NEGATIVE EFFECTS			
CLASSIFICATION	CODE OF THREATS - PRESSURES	DESCRIPTION	SPATIAL DISTRIBUTION
A. AGRICULTURE - LIVESTOCK			
L	A02.03	Conversion of grassland to arable land	i
M	A04.0 1	Intensive grazing	i
M	A04.03	Abandonment of pastoral grazing, lack of pastures	i
M	A0 5 .03	Livestock and removal of small landscape features for parcel consolidation (no grazing)	i
THE	A06.01.01	Intensification of annual crops for food production	i
M	A07	Use of biocides, hormones and chemicals	b
H	A0 10	Reorganization and restructuring of arable land exploitation	i
C. MINING, EXTRACTION OF RESOURCES, PRODUCTION OF ENERGY PRODUCTS			
H	C03.03	PV installations	b
E. URBANIZATION, RESIDENTIAL AND COMMERCIAL DEVELOPMENT			
M	E03	Rejections	i
K. NATURAL BIOTIC & ABIOTIC PROCESSES (NON-DESTRUCTIVE)			
H	K0 1 .0 1	Corrosion	i
L. GEOLOGICAL EVENTS, NATURAL DISASTERS			
M	L09	Fire (natural causes)	i

Explanation :

Rank: H = High, M = Medium, L = Low

i = In, o = Out, b = Both

As can be seen from the bulletins of the region, the most intense pressures within the boundaries of the region concern the intensification of annual crops for food production, the installations of PV projects and the industrial expansion. Abandonment of pastoral grazing and lack of pasture, use of biocides, transport roads, landfills, human outdoor activity, noise pollution and problem native species have moderate impacts. While little pressure is exerted by predation. **From the above it follows that the activities of Wind Farms are not considered as a negative impact on the SPA area GR 1110008 (riparian forest of Evros and Ardas)**

3.6. DUE IMPACT ASSESSMENT (according to article 6.3 of Directive 92/43)

"Each project [or project], not directly connected or necessary for the management of the site, but which may significantly affect the site in question, alone or jointly with other projects [or projects], is duly assessed in terms of its effects on the site, taking into account its conservation objectives. Based on the conclusions of the assessment of the effects on the site and excluding the case of the provisions of paragraph 4, the competent national authorities agree on the relevant plan [or project] only after making sure that it will not impair the integrity of the site in question and, possibly , after public opinion is first expressed." (Article 6, Paragraph 3 - Directive 92/43/EEC)

According to the Official Journal of the European Union (C 33, 25.1.2019), the procedure of Article 6(3) is triggered not by the certainty but by the *possibility* of significant effects resulting from plans or projects, regardless of whether they are inside or outside protected place. **The significance of the impacts should be determined in relation to the specific characteristics and environmental conditions of the protected site** concerned by the plan or project, taking particular account of the conservation objectives and ecological characteristics of the site. Due consideration therefore focuses specifically on the species on the basis of which the Natura 2000 site has been designated.

For the study area (GR 1110008 Riparian forest of northern Evros and Ardas) no conservation objectives have been set and according to the guidelines of the Official Journal of the European Union (C 33, 25.1.2019): In the cases in which **no conservation objectives have been set** for a site, and until they are defined, due consideration must take as a minimum the assumption that the objective is to ensure that *the habitat types* or *habitats of the species* occurring at the site are not degraded below the existing level or that the species are not significantly disturbed , in accordance with the requirements of Article 6 paragraph 2 and without prejudice to the effectiveness of the conservation measures required to fulfill the requirements of Article 6 paragraph 1. In accordance with the requirements of Article 6 paragraph 2 of the guidelines of the European Commission Brussels, (C 2018 – 7621, 21.11.2018): **Disturbances affecting a species occur in a place due to events, activities or processes that contribute, within the place, to the long-term decline of the population of the species, the decline or the risk of decline in the area of its natural distribution and in reducing the extent of its available habitat. This assessment is carried out in accordance with the conservation objectives of the site and its contribution to the cohesion of the network.**

3.6.1. Due assessment of impacts on habitat types

The definition of habitat types at the project site was done by the study team with on-site autopsies and plant surveys, and photo interpretation of aerial photographs. All the projects will be carried out in barren and forest-type lands, mainly in scrublands, without the existence of threatened vegetation species.

The total area occupied by the Wind Farm installation projects, including existing roads (road improvement) amounts to 33.58 h a. The percentage of occupancy of the planned projects in relation to the area of the study area amounts to 0.00%, as all the W/T and road connection projects of the Wind Farm are being built OUTSIDE the NATURA 2000 area. The projects will be built in oak forest sites outside of SA. Therefore the rate of loss of habitat types – the area of the study area, is zero and does not change the overall degree of conservation.

The largest percentage of takeover area will be in the 934A sclerophyllous evergreen broadleaf shrub-like habitat type and in the 91MO habitat type representing oak forests. The interconnection network of the Wind Farm under study with the New Substation will be installed on an existing road network.

91MO habitat conservation objectives at national level:

- To keep the extent and range of the habitat type constant at the national level and not to make significant changes in its distribution pattern within the distribution range and not to become smaller (extent and range) than the Satisfactory Area and the Satisfactory Reference Range.
- To preserve special structures and functions (and typical species) at a Satisfactory Level of Conservation (FV).
- Also to keep the pressures and threats exerted at a low intensity with little or moderate effect / impact, thus contributing to the maintenance of the Good-G future prospects of the structure and functions of the habitat type.

92AO habitat conservation objectives at the national level:

- Maintain or increase the extent and range of habitat types nationally and not fall below (the extent and range) the Satisfactory Extent and the Satisfactory Reference Range respectively
- a) Improving/upgrading the current state of structures and functions (including standard items) to tend to a Satisfactory Level of Conservation (FV)
- b) Changing the type and intensity of pressures and threats from: • moderate to high with moderate or high impact/impact • to low to moderate intensity with low to moderate impact/impact, and therefore contributing to upgrading its future prospects structure and functions of habitat type from Poor-P to Good-G

92 C O habitat conservation objectives at the national level

- To keep the extent and range of the habitat type constant at the national level and not to make significant changes in its distribution pattern within the distribution range, and not to become smaller (extent and range) than the Satisfactory Area and the Satisfactory Reference Range.
- To keep the extent and range of the habitat type constant at the national level and not to make significant changes in its distribution pattern within the distribution range, and not to become smaller (extent and range) than the Satisfactory Area and the Satisfactory Reference Range.

- Preservation of specific structures and functions (and typical species) at a Fair Level of Preservation (FV)
- Keeping applied pressures and threats at low intensity with little or moderate effect/impact, thereby contributing to the maintenance of the Good-G future prospects of the structure and functions of the habitat type.

3280 habitat conservation goals at the national level

- Maintain or increase the extent and range of habitat types nationally and not fall below (the extent and range) the Satisfactory Extent and the Satisfactory Reference Range respectively
- a) Improving/upgrading the current state of structures and functions (including standard items) to tend to a Satisfactory Level of Conservation (FV)
- b) Changing the type and intensity of pressures and threats from: • moderate to high with moderate or high impact/impact • to low to moderate intensity with low to moderate impact/impact, and therefore contributing to upgrading its future prospects structure and functions of habitat type from Poor-P to Good-G

The recorded impacts on habitats from the installation and operation of a wind farm are as follows:

- Direct loss or reduction of habitat extent due to its removal, remodeling or cover (e.g. from the deposition of construction materials or suspended sediments)
- Fragmentation → the conversion of a contiguous area of habitat into two or more small, isolated areas
- Nuisance → a temporary change in average environmental conditions (e.g. increase in suspended sediment or dust deposition or increase in human presence, light and noise)
- Indirect impacts → habitat loss, fragmentation and degradation due to, for example, soil compaction, drainage, change of use or the introduction of invasive non-native species and pollutants

The results of the evaluation of the elements of the natural environment in the FRA and in the wider area of the project under study demonstrated the good conservation status of the types of habitats and flora species and the favorable prospects for their conservation.

Some of the above negative effects are minimized by the following actions:

- After construction, all the excavation trenches will be rehabilitated.
- The operation phase of the wind farm will not affect habitat types and flora species at all, as the changes in air temperature and humidity due to the movement of the blades are considered to be of minor importance and small in extent.

- During the operation phase, there will be no significant impact on the vegetation, as the area occupied by the wind turbines is small compared to the Study Area.

The area of the facilities is located in areas with oak forest vegetation and gaps. The habitat type representing the project area is not a priority habitat type.

The surfaces of the W/T squares will be limited to the absolutely necessary, significantly reducing logging and extensive interventions in the forest. The areas of the Wind Farm in operation will be free everywhere and there will be no installation of fencing or the creation of large closed surfaces. Therefore, there is no effect of habitat fragmentation. The connection will be made using the existing forestry road network which has existed in the landscape for decades and is already (based on biodeclarative findings) mostly used by mammals during their movements.

Therefore, according to the above, **there are no adverse effects from the construction and operation of the wind farm under study on the ecological functions and the state of conservation of the types of habitats and flora species** , as long as the synergistic effects do not increase exponentially in relation to time.

During the construction phase, no large-scale effects on vegetation and habitat types are expected .

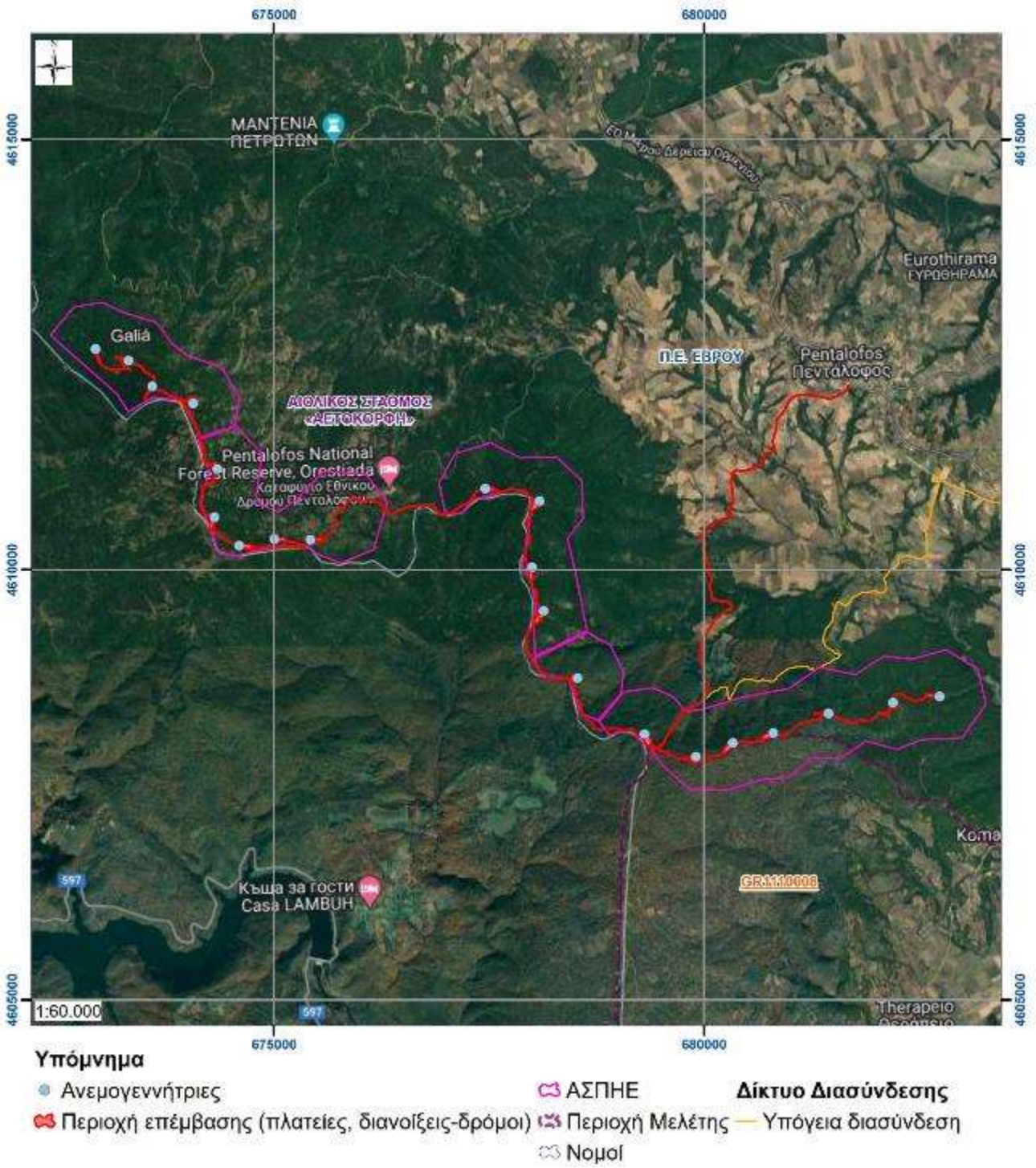

Figure 3-8 Occupancy surfaces from the construction of the Wind Farm at the "Aetokorfi" location.

3.6.2. Due assessment of effects on flora

The planned projects will be carried out in areas of oak forest and gaps, where no species of flora have been identified which are referred to in Article 4 of Directive 2009/147/EU and are included in the list of Annex II of Directive 92/43/EEC. The effects on the flora are considered small **.**

In fact, the supervision of the Wind Farm by the staff of the station during the operation phase is evaluated with a positive sign, which will have a deterrent effect on the significant impact on the forest to date (and recorded during the autopsies) of illegal logging that takes place mainly through passes from the Bulgarian territory but also in the protection against forest fires through the timely detection of fire outbreaks.

3.6.3. Due faunal impact assessment

The analysis of the due impact assessment is done for fauna species included in Annex II of the E.P. 14849/853 /E 103. In the project under study, it is estimated that the following species are active and directly affected.

Testudo hermanni **(Mediterranean turtle):** The project is expected to affect the behavior of the taxon (disturbance) during the construction work of the W/T construction site, the work of improving and opening the access and connection roads and the transfer of the wind turbine elements, **impact which is considered to be of low importance, of short duration and ultimately reversible after the end of the works.** Additionally, during the operation of the project, no disturbance is expected, as the noise production from the wind turbines is estimated to be at low levels.

Myotis emarginatus **(Pyrromyotid)** : It is a relatively small bat, with a weight of 6-9 gr and a wingspan between 22 and 25 cm . It prefers broad-leaved (mainly) forests with a variety of micro-habitats, steppe and bushy areas, but also livestock areas, where it hunts insects in stables. In the south of its distribution, including Greece, it forms colonies mainly in caves and mines (all year round), less often in buildings and on rock roofs. Hunts near vegetation, forest edges and among tree canopy, collecting insects on top of leaves. In the stables he catches flies from the ceiling and walls. The maximum known distance between hunting areas and summer shelters is 12.5 km . She gives birth to a young, from the end of May to the middle of July. Some females mate from the first fall. Breeding colonies use a network of contiguous shelters and often number 20 to 500 females, sometimes up to several thousand, and include a few males. In Mediterranean areas including Greece, they are usually found in caves along with other species (genera *Rhinolophus, Myotis* , and *Miniopterus*). The maximum known age is 18 years. It feeds mainly on spiders, phalanges, diptera, neuroptera and lepidoptera, much less on coleoptera and hymenoptera. Flies of the genus Musca constitute the major proportion of the remains in the faeces of stable-fed individuals. It is included in Annex II of the Bern and Bonn Conventions, as well as in Annexes II and IV of EU Directive 92/43. It is protected by Presidential

Decree 67/81 and by UNEP/EUROBATS. It is internationally classified by the IUCN as a species of Least Concern. In Greece it is classified as Near Threatened as, while it has a wide distribution, it shows a high dependence on caves and other underground habitats and its populations are rather fragmented. At the northern end of its range, populations have declined significantly due to loss of its hunting habitats and the use of agrochemicals, while landscape fragmentation due to road construction is an equally significant threat. It is also threatened by the tourist exploitation of caves and in general the disturbance in underground shelters. The species will likely be affected by the installation of the project under study, although the probability of impact is not high.

The recorded impacts on **bats** from the installation and operation of a Wind Farm according to the EU are as follows:

- Disturbance and displacement in colonies, such as habitat loss or the presence of vehicles and maintenance personnel can result in changes in temperature, light, noise and vibration within the refuge, with consequent reduction in use or reproductive potential.
- fragmentation, loss and degradation — the removal from supporting habitats
- Collision
- Barrier effect
- Barotrauma — the deadly interaction between bats in flight and wind turbine structures
- Loss or displacement of flight paths and places of refuge — the physical or operational loss of flight paths and places of refuge.
- Increased availability of invertebrate prey and insects in W/Ts due to night lighting with consequent potential increase in collision risk

Disturbance and displacement can occur at any stage during the project life cycle, with barrier effects occurring during operation and upgrading. These potentially significant effects may result in behavioral changes, including attraction (Behr et al. 2018; Foo et al. 2017), spatial displacement of flight paths, and exclusion of bats from foraging habitats they would otherwise use (Barré et al. 2018). Attraction could result in a higher risk of collision (Rydell et al. 2010a; Voigt et al. 2018). However, Millon et al. (2018) considered displacement to be an important effect to consider and Barré et al. (2018) have recently quantified this impact on several wind farms.

The chiroptera species that will be affected by the installation under study are the following *: Rhinolophus ferrumequinum)* , Micromyotid (*Myotis blythii*), Tranomyotid (*Myotis myotis*), Pyrromyotid *(Myotis emarginatus)* , Little bat *(Eptesicus serotinus)* , Mustache bat *(Myotis mystacinus)* , Nyctalus *(Nyctalus leisleri)* , Nanobat *(Pipistrellus pipistrellus)* , *Microbat (Pipistrellus*

pygmaeus) , Mountain bat *(Hypsugo savii)* , Gray eared bat *(Plecotus austriacus)* , *Myotis emarginatus)* , Bat *(Miniopterus schreibersii)* .

The project is expected to affect the behavior of chiroptera species (mainly non-Appendix II species) during the night operation of the wind turbines, mainly on windy nights, between the summer months and the early autumn months. It is proposed to carry out a program to monitor the activity of the chiroptera in the project area. In addition, it is proposed to carry out a monitoring program of the effects on the behavior and ecology of chiroptera during the construction phase and during the operation phase of the project under study, in order to ensure effective protection.

***Canis lupus* (Wolf) :** Its presence is confirmed by bibliographic sources and records of bioindicator traces during field work. The project is expected to affect the behavior of the taxon in the construction phase of the Wind Farm (opening/widening of the road network, transportation and installation of pillars). Monitoring studies in Portugal indicated a correlation between the displacement of wolf populations and the construction of wind farms, as well as changes in the selection of breeding sites used at birth and cub-rearing habitats (Costa et et al ., 2018). However, newly established flocks, which have recently re-established in areas with already constructed wind farms, have shown relative tolerance to these infrastructures, choosing breeding areas less than 3 km from wind turbines (Costa et et al ., 2018). This is also confirmed by other authors (Helldin et al ., 2012) , who report that large animals may temporarily avoid wind farms during the construction phase, but when machinery and human presence are reduced, they appear to be able to acclimatize to wind farms, although these responses may to vary by species, sex, age, person, year or type of disorder. In conclusion, the project is expected to have an impact on the spatial behavior of the wolf during the construction phase of the wind farm, as the species' territory is located within the FRA, without this having irreversible consequences for the ecological balance of the taxon . According to the data of recorded attacks of the species in the year 2013 in the wider area of the project there are no declared disasters from attacks on livestock. Of course, we mention that the livestock capital of the region is very small. In addition, it is recommended to draw up a monitoring program in order to check whether it is necessary by region (depending on the appearance of the species) to stop the work of the project (construction phase) during the reproductive period of the wolf, i.e. between January and March, so that there is no disturbance in its biological cycle. In any case, the implementation of a monitoring program must focus on the effects on the behavior and ecology of the wolf during the construction phase and during the operation phase of the project under study.

3.6.4. Due avifauna impact assessment

From the construction and operation of the Wind Farm in the location "Aetokorfi", the possible potential effects, including the synergistic effects, of the project on the structure, coherence and functioning of

the SPA area GR 1110008 " Riparian forest of northern Evros and Ardas" of the Natura 2000 Network, are reported mainly:

(a) in the evaluation of the loss or change of the breeding, feeding or resting habitats of the birds of Annex I of the Directive 2009/147/EC from the construction of the wind farm,

(b) in the assessment of the probability of death from possible collisions of the birds on the towers and blades of the W/T during the operation of the wind farm, and

(c) in the assessment of disturbances or the displacement of bird species both during the construction stage and during the operation of the wind farm.

In the previous chapters there was a detailed presentation of the expected impacts from the construction and operation of the Wind Farm under study in a way that they fully cover the requirements of the proper impact assessment.

The proper impact assessment for the avifauna is done exclusively for the species of Annex I of Directive 2009/147/EC and is analyzed in the construction and operation phase.

3.6.5. Effects on avifauna from habitat loss

Construction phase

Partial habitat loss is caused during the construction phase of the Wind Farm under study. This specific type of impact does not greatly affect the existence of suitable habitat (sufficient area and good quality) of the SPA designation species and therefore does not affect their conservation objectives.

The loss of habitat for the birds of prey and waterfowl recorded in the FRA is **"small"** in terms of the ecological impact size criterion (loss of **0.15%** of the SPA - ratio of area of works (Roads, W/T squares) to area of SPA) , since they are active in large areas, the surface of the W/T bases will bring about small changes in their feeding, reproduction or rest. Also, the effect from the construction of the groove for the placement of the energy transmission cables is judged to be **"nil" .** Therefore, **the overall nature of the ecological impact on birds is considered to be 'minor'** as no major population changes are expected, but neither are conservation objectives for these species expected to be affected over the period of the works, as it does not coincide with the breeding season. Ostriches and mid-sized birds are active in a smaller area, which may be a few hundred square meters around their nest, and therefore even a small loss of space can affect their density. **However, due to the very small scale of interventions in the area of the SPA, and especially on surfaces not used for reproduction by the designated species, no significant effects are expected on the populations of the above species, nor a negative effect on their conservation objectives and favorable reference values (ETA).** The loss of surface from the formation of the bases for the placement of W/T is expected to be **"negligible"** for ostriches, and **"neutral"** in terms of the overall ecological

impact on these species. Conversely, rutting may have **"positive"** ecological effects on ostriches, from soil disturbance and the creation of potentially suitable nesting sites for species that nest on the ground or on road slopes. In conclusion, **the loss of habitat from the placement of the bases and the excavation of the groove during the construction stage of the Wind Farm is not expected to negatively affect the populations of the species of Annex I of the Directive 2009/147/EC, while some species of ostriches may be favored by certain works of the Wind Farm under study.**

Changes in habitat preferences due to the works of the installation of the wind farm, destruction of nests, as well as possible losses of bird individuals due to works or collision must be recorded, if detected.

Operation Phase

During the operational phase, the bird species that use the habitat, and especially the most sensitive to human intervention and disturbance, either leave the area, or enter a process of adapting to the new conditions, thanks to the survival instinct. Beyond that there is no further loss of habitat as there will be no additional deforestation. The project site is mostly accessed using existing roads (improvements) and is not located in remote and roadless natural areas. The pitches and access roads will remain free for shared use and there will be no areas blocked off by fencing (apart from the small area of the control booth). Therefore, there is no impact of habitat fragmentation during the operational phase.

3.6.6. Impacts on fauna and avifauna from collisions

The effects of collisions of birds with W/Ts may exist only during the operation of the Wind Farm under study. These mainly refer to the killing of birds that may be caused by their collision with the mobile (blades) or stationary (tower) parts of the W/T. The type of impact may affect population size, thus its dynamics, and thus shape species' population levels in the long term. Therefore, collision kills may affect the breeding population of species listed in Annex I of Directive 2009/147/EC. The impact of collisions is different in the groups of birds, with that of ostriches and medium-sized birds being negligible, while for large-sized birds (raptors, waterfowl, geese, storks) it varies according to their biological characteristics, technical characteristics and the installation location of the birds. each wind farm.

Specifically, and per recorded species of Annex I of JMD E.P.37338/1807/ E103, the results are as follows:

A) Vulture *(Gyps fulvus*)

The species does not nest in the project area and does not show frequent activity beyond small-scale infrequent crossings. The wider area is a spread area of the species that reproduces

in the area of Dadia. It is known that Vultures are now almost exclusively dependent on extensive animal husbandry to ensure their food. Thus, they have now synchronized their annual biological cycle with extensive/nomadic pastoralism practices to take advantage of seasonal food availability. In winter, vultures are found at lower altitudes, often at the edges of the plains, where they always build their nests on inaccessible cliffs. At this time the mountains are covered with snow and the herds are in low altitude areas. In summer, the return of the flocks to the mountain pastures also marks the shift of the vulture flocks to higher altitudes. There are cases in which vultures make daily movements between nesting sites and mountain meadows, while at other times they establish new roosting sites (summer roosts) at high altitudes, away from breeding sites so that they are closer to the foraging area. type in a wind turbine increases in case of approach due to the existence of a body in the wider area of the Wind Farm and around the W/T. These effects are reduced by the immediate removal of corpses from the area near the W/T.

The impact on the species is estimated to be small due to the fact that the livestock activity in the area is very small.

The use of the bird detection system using cameras and a sound emission system to prevent and stop W/Ts is an important method of preventing the impact of the species. The project operator, in the context of minimizing the effects of Wind Farm on the phenomenon of mortality, will place the systems in all W/Ts by investigating the possibility of placing a thermal camera.

The conservation objectives outlined for the SPA for the species are the protection of suitable habitats and the conservation of breeding pairs. At National level the favorable reference prices (ETA = 300) are 300 pairs. For the SPA area GR 1110008 no ETA price has been set for the item.

From the analysis of field data and telemetry data from the Movebank online database it appears that the species mainly passes south and south-west of the project sites on the axis connecting the Dadia colony to the Bulgarian population.

As derived from the use of the Band method to estimate expected mortality due to collision the expected crossings of the species amount to 7.027 per year, while the expected mortality taking into account the avoidance rate was estimated at 0.0444 individuals per year. Using the tracking systems, the above mortality is estimated at 0.0222 people per year .

Therefore, in the area where the Wind Farm is proposed to be installed, the foraging habitat of the species is not expected to be degraded. From field observations, no breeding territory is confirmed in the project area. According to the second evaluation criterion, the size of the impact of the construction and operation of the Wind Farm is **"low".** Therefore, the importance of the impact of the construction and operation of the Wind Farm on the species is estimated as **"small".** Overall, the construction and operation of the Wind Farm is expected to minimally affect the integrity of the population, both in the

study area and in the spread area, and therefore the nature of the effect from the Wind Farm is characterized as minor.

B) Black vulture (*Aegypius monachus*)

It was recorded in the area of Wind Farm in simple crossings, one of which at the site of the works (RFC). The species does not nest in the area, but shows intense activity in the wider area within a radius of up to 20 Km from the project. After all, as can be seen from the telemetry data using GPS transmitters on individuals of the species, the usual routes of the species are located at a considerable distance from the projects. The wider area is a distribution area of the species which nests in Dadia and appears throughout the region of Thrace. The possibility of the species hitting a wind turbine increases in case of approach due to the presence of a corpse in the wider area of the Wind Farm and around the W/T. These effects are reduced by the immediate removal of corpses from the area near the W/T. The impact on the species is estimated to be small due to the fact that the livestock activity in the area is very small.

The use of the bird detection system using cameras and a sound emission system to prevent and stop W/Ts is an important method of preventing the impact of the species. The project operator, in the context of minimizing the effects of Wind Farm on the phenomenon of mortality, will place the systems in all W/Ts by investigating the possibility of placing a thermal camera.

According to the statistical analysis of the field data and the application of the Band model , the number of passages for the species was estimated at 9.486 individuals per year, while the expected mortality including the avoidance rate was estimated at 0.0614 individuals per year. Using the tracking systems, the above mortality is estimated at 0.0307 people per year.

At the National level of the distribution area of the Black Vulture the favorable reference values (ETA = 50) are 50 pairs.

From the analysis of field data and telemetry data from the Movebank online database it appears that the species mainly passes south and south-west of the project sites on the axis connecting the Dadia colony to the Bulgarian population.

Therefore, in the area where the Wind Farm is proposed to be installed, the foraging habitat of the species is not expected to be degraded. From field observations, no breeding territory is confirmed in the project area. According to the second evaluation criterion, the size of the impact of the construction and operation of the Wind Farm is **"low".** Therefore, the importance of the impact of the construction and operation of the Wind Farm on the species is estimated as **"small".** Overall, the construction and operation of the Wind Farm is expected to minimally affect the integrity of the population, both in the study area and in the spread area, and therefore the nature of the effect from the Wind Farm is characterized as minor.

C) Golden eagle (*Aquila chrysaetos*)

Recorded in single person flights at high altitude. We consider the wider area to be a passage and foraging site for the species and territory of a breeding pair. In the FRA and within a radius of up to 5 Km, no possible nesting site was identified . The activity and frequency of passage of the species from the Wind Farm site is frequent and must be taken into account when planning the monitoring program. **The use of the Dt Bird or Digisec system is an important method of preventing species collision.** As mentioned in the case of Gyps Fulvus, many flights of the Golden Eagle were recorded at a height below the position of the Wind Farm and this carries the risk of the species hitting a blade of the W/T during its ascent from the bottom up.

As derived from the use of the Band method to estimate expected mortality due to collision the expected crossings of the species amount to 8.919 per year, while the expected mortality taking into account the avoidance rate was estimated at 0.0415 individuals per year. Using the tracking systems, the above mortality is estimated at 0.0207 people per year.

The conservation objectives outlined for the SPA for the species are the protection of suitable habitats and the conservation of breeding pairs. At National level the favorable reference prices (ETA = 150) are 150 pairs. For the SPA area GR 1110008 no ETA price has been set for the item.

Overall, the construction and operation of the Wind Farm is expected to moderately affect the integrity of the population in case the proposed measures are not taken, both in the studied area and in the area of spread and therefore the nature of the effect from the Wind Farm is characterized as small.

D) Fidaetos (*Circaetus gallicus*)

It was recorded several times in flights at the site of the project and at a distance from it. Recorded in foraging and demonstration flights. The behavior of the species and its flight ability in combination with records of its behavior in an operational Wind Farm (studies by the author of this Wind Farm Tortoise Monitoring Program in M.U. Karystos 2018-2019, Wind Farm Pyrgos Monitoring Program in M.U. Karystos 2018-2019 and Monitoring Program Wind Farm Mikri Toumba in NE Sidirokastro 2016-2017) showed a very good adaptation to the construction and operation of W/T without recording mortality.

As derived from the use of the Band method to estimate expected mortality due to collision the expected crossings of the species amount to 20.192 per year, while the expected mortality taking into account the avoidance rate was estimated at 0.841 individuals per year. Using the tracking systems, the above mortality is estimated at 0.042 people per year.

The conservation objectives outlined for the SPA for the species are the protection of suitable habitats and the conservation of breeding pairs. At National level the favorable reference prices (ETA = 300) are 300 pairs. For the SPA area GR1110008 a value of ETA = 2 persons with a spread of 236.00 km^2 has been set .

Overall, the construction and operation of the Wind Farm is expected to moderately affect the integrity of the population without taking measures, both in the study area and in the spread area and therefore the nature of the impact from the Wind Farm is characterized as moderate.

E) Gerakaetos (*Hieraaetus pennatus*)

It was recorded a total of 21 times in flights of a mature male. Recorded on feeding flights. The activity of the species in the location of Wind Farm is frequent mainly in the west and NW .

As derived from the use of the Band method to estimate expected mortality due to collision the expected crossings of the species amount to 18,851 per year, while the expected mortality taking into account the avoidance rate was estimated at 0.0636 individuals per year. Using the tracking systems, the above mortality is estimated at 0.0318 people per year.

The conservation objectives outlined for the SPA for the species are the protection of suitable habitats and the conservation of breeding pairs. At National level the favorable reference values (ETA = 100) are 100 pairs. For the SPA area GR1110008 no ETA value or spread range has been defined.

F) Kravgaetos (*Clanga pomarina*)

It was recorded thirteen (13) times in flights in the wider area. The wider area of the wetland of the Ardas and Evros water streams is the habitat of the species. The species does not nest near the project and was not recorded any other time. The use of the Dt Bird or Digisec system is an important method of preventing collision of the species.

As derived from the use of the Band method to estimate expected mortality due to collision the expected crossings of the species amount to 6.298 per year, while the expected mortality taking into account the avoidance rate was estimated at 0.0309 individuals per year. Using the tracking systems, the above mortality is estimated at 0.0155 people per year.

The conservation objectives outlined for the SPA for the species are the protection of suitable habitats and the conservation of breeding pairs. At the National level, the favorable reference values (ETA = 90) are 90 pairs. For the SPA area GR1130008 a value of ETA = 2 pairs with a spread range of 259.31 km^2 has been set .

Overall, the construction and operation of the Wind Farm is expected to moderately affect the integrity of the population without taking measures, both in the study area and in the spread area, and therefore the nature of the impact from the Wind Farm is characterized as low.

G) *Accipiter brevipes* (Saini)

Recorded once in flight from perch to tree and in flights at a distance from the site of the works. Forests are the main habitat of the species, therefore we believe that the location of the project will affect the species.

As derived from using the Band method to estimate expected mortality due to collision, the expected crossings of the species are 0.554 per year, while the expected mortality taking into account the avoidance rate was estimated at 0.0013 individuals per year. Using the tracking systems, the above mortality is estimated at 0.0007 people per year.

The conservation objectives outlined for the SPA for the species are the protection of suitable habitats and the conservation of breeding pairs. At National level the favorable reference values (ETA = 1000) are 1000 pairs. For the SPA area GR1110008 a value of ETA = 20 persons with a spread of 235.10 km^2 has been set .

H) *Ciconia nigra* (Black stork)

It was recorded a total of eleven (11) times in one- and two-person flights and in three cases in a standing position in a stream bed and at a distance from the W/T positions. The activity of the species was recorded in high-altitude flights of 100 - 200 m but also descents in gullies and canals. The usual activity was at a distance from the project site mainly to the north in the Ardas river bed and in ravines and canals in the wider area.

The impact of the projects due to their location between two important water ecosystems of the rivers Evros and Ardas is judged to be moderate to significant and the countermeasures proposed here must be taken into account.

As derived from the use of the Band method to estimate expected mortality due to collision the expected crossings of the species amount to 4.066 per year, while the expected mortality taking into account the avoidance rate was estimated at 0.020 individuals per year. Using the tracking systems, the above mortality is estimated at 0.01 people per year.

The conservation objectives outlined for the SPA for the species are the protection of suitable habitats and the conservation of breeding pairs. At the National level, the favorable reference values (ETA = 80) are 80 pairs. For the SPA area GR1110008 No ETA value has been set but a spread of 259.00 km^2 .

I) *Ciconia ciconia* (Stork)

It was recorded repeatedly from March to September. During spring and summer observations significant numbers of up to 250 individuals were recorded foraging in threshed and recently harvested fields some distance from the works to the east. In fact, a significant number was recorded in search of food alongside harvesting operations in the fields. The species nests in artificial and natural nests in and near settlements and uses the agricultural lands of the region for foraging. Typical flights include movements from the nests to the agricultural and barren areas where they forage and return to the nests to carry food to the chicks. The flights are mainly medium and low altitude within the W/T's CHR zone.

The impact of the projects is considered to be small, nevertheless, all the proposed countermeasures must be taken, such as the use of identification systems and sounds to prevent and shut down the W/T and the implementation of a monitoring program.

As derived from the use of the Band method to estimate expected mortality due to collision the expected crossings of the species amount to 6.588 per year, while the expected mortality taking into account the avoidance rate was estimated at 0.0208 individuals per year. Using the tracking systems, the above mortality is estimated at 0.0104 individuals per year.

The conservation objectives outlined for the SPA for the species are the protection of suitable habitats and the conservation of breeding pairs. At National level the favorable reference prices (ETA = 2500) are 2500 pairs. For the SPA area GR1110008 No ETA value has been set but a spread of 259.00 km^2.

I) *Falco peregrinus* (Pterite)

Recorded once in flight. No nesting sites were identified in the project area. According to the bibliographic data and the SDF of the Bulgarian NATURA 2000 area, the territory of a breeding pair exists in the area.

The impact of the projects due to their location is judged to be moderate to small and the countermeasures proposed here must be taken into account.

As derived from using the Band method to estimate expected mortality due to collision, the expected crossings of the species are 0.841 per year, while the expected mortality taking into account the avoidance rate was estimated at 0.0019 individuals per year. Using the tracking systems, the above mortality is estimated at 0.0009 people per year.

The conservation objectives outlined for the SPA for the species are the protection of suitable habitats and the conservation of breeding pairs. At National level the favorable reference prices (ETA = 350) are 350 pairs. For the SPA area GR1110008 no ETA value has been set.

K) *Pernis apivorus* (Sfikiaris)

Recorded twice (2) at the end of September, during the migration season. No nesting sites were identified in the project area.

As derived from the use of the Band method to estimate expected mortality due to collision, the expected crossings of the species amount to 70.26 per year, while the expected mortality taking into account the avoidance rate was estimated at 0.27 individuals per year. Using the tracking systems, the above mortality is estimated at 0.13 people per year. The overall impact is considered very small.

The conservation objectives outlined for the SPA for the species are the protection of suitable habitats and the conservation of breeding pairs. At National level the favorable reference values (ETA = 1000)

are 1000 pairs. For the SPA area GR1110008 No ETA value has been set but the spread range is 259.31 km^2 .

IB) Milvus *migrans (Tsiftis)*

Recorded four times during migration in flight and perched in close proximity to works.

As derived from using the Band method to estimate expected mortality due to collision, the expected crossings of the species are 0.666 per year, while the expected mortality taking into account the avoidance rate was estimated at 0.0024 individuals per year. Using the tracking systems, the above mortality is estimated at 0.0012 people per year. The overall impact is considered very small.

The conservation objectives outlined for the SPA for the species are the protection of suitable habitats and the conservation of breeding pairs. At National level, the favorable reference values (ETA = 20) are 20 pairs. For the SPA area GR1110008 No ETA value has been set but the spread range is 259.31 km^2 .

IC) *Circus* aeruginosus (Kalamokirikos)

It was recorded in a number of measurements at the site of the works throughout the year and more often during migration. The corncrake does not use the project area for foraging, as it was recorded in the agricultural lands to the east. The lowland area between the rivers Ardas and Evros is a feeding place and an important area between their wetland ecosystems.

As derived from the use of the Band method to estimate expected mortality due to collision the expected crossings of the species amount to 4.681 per year, while the expected mortality taking into account the avoidance rate was estimated at 0.0179 individuals per year. Using the tracking systems, the above mortality is estimated at 0.009 people per year. The overall impact is considered small.

The conservation objectives outlined for the SPA for the species are the protection of suitable habitats and the conservation of breeding pairs. At the National level, the favorable reference prices (ETA = 80) are 80 bfe . For the SPA area GR1110008 No ETA value has been set but a spread of 259.00 km^2 .

ID) *Circus cyaneus* (Chimonokirikos)

Records were made in flights at a distance from the Wind Farm positions during the November - February measurement period. It was found in the area of agricultural crops and not in the locations of the planned projects.

As derived from the use of the Band method to estimate expected mortality due to collision the expected crossings of the species amount to 4.344 per year, while the expected mortality taking into account the avoidance rate was estimated at 0.0166 individuals per year. Using the tracking systems, the above mortality is estimated at 0.0083 people per year. The overall impact is considered small.

The conservation objectives outlined for the SPA for the species are the protection of suitable habitats and the conservation of breeding pairs. At National level Favorable Reference Prices (FRPs) have not been defined. For the SPA area GR1110008 No ETA value has been set but a spread of 259.00 km^2.

IE) Aetomachos (*Lanius collurio*)

It was recorded in a number of mainly one-person and two-person observations. The activity of the species during the summer is frequent in the wider area. Given that the construction works will be done outside the breeding season, the impacts during the construction phase will be significantly reduced. The probability of encountering W/T is considered negligible for the species, as its flights are restricted to low altitude outside the scanning area of W/T and normal activity occurs in bushy and wooded areas.

The conservation objectives described for the SPA for the species are to protect suitable habitats. At National level the favorable reference prices (ETA = 10,000) are 10,000 pairs. For the SPA area GR1110008 a value of ETA = 11 people per 1 Km^2 has been set in a spread of 259.31 km^2 .

Overall, the construction and operation of the Wind Farm is expected to have little impact on the integrity of the population, both in the study area and in the spread area, and therefore the nature of the impact from the Wind Farm is characterized as low.

IF) *Hippolais olivetorum* (Liostritsida)

Recorded 3-4 times in single bushes and 2 individuals, it is estimated that the project will affect the species only during the construction phase. By implementing the measures and basically avoiding work during the breeding season, the overall impact is considered small. After all, the nature of the works is not part of the ecological threats to the species.

The conservation objectives described for the SPA for the species are to protect suitable habitats. At National level the favorable reference prices (ETA = 5000) are 5,000 pairs. For the SPA area GR1110008 , an ETA value has NOT been set, but a spread of 179.79 km^2 .

IG) *Melanocorypha calandra* (Galiantra)

It is found in the wider area, and in the agricultural lands, it was recorded several times at the site of the works in bushy places.

By implementing the measures and basically avoiding work during the breeding season, the overall impact is considered small. After all, the nature of the works is not part of the ecological threats to the species.

The conservation objectives described for the SPA for the species are to protect suitable habitats. At National level the favorable reference prices (ETA = 5000) are 5,000 pairs. For the SPA area GR1110008 NO ETA value has been set but a spread of 259.00 km^2 .

IH) Balkan Woodpecker (*Dendrocopos syriacus*) – Medium Woodpecker *(Dendrocopos medius)* – Black Woodpecker *(Dryocopus martius)*

Woodpeckers are not expected to experience mortality from collision on the structural elements and blades of the W/T under study and the neighbors in this wind farm. The Wind Farm under study will not affect the species during its operation. The effects on the species are mainly related to disturbances during construction.

Reconnaissance of nesting sites in hollow trees is recommended prior to commencement of work, and restriction of works outside the breeding and rearing season until they have left the nests is a measure to mitigate impacts on species.

The conservation objectives described for the SPA, for Dendrocopos syriacus is the protection of suitable habitats. At National level the favorable reference prices (ETA = 10,000) are 10,000 pairs. For the SPA area GR1110008 , an ETA value has NOT been set, but a spread of 212.28 km^2 .

The conservation objectives described for the SPA, for Dryocopus martius is the protection of suitable habitats. At National level the favorable reference prices (ETA = 1500) are 1500 pairs. For the SPA area GR1110008, an ETA value has NOT been set.

The conservation objectives described for the SPA, for Dendrocopos medius is the protection of suitable habitats. At National level the favorable reference prices (ETA = 10,000) are 10,000 pairs. For the SPA area GR1110008, an ETA value has NOT been set, but a spreading range of 202.00 km^2.

K) Laggona (*Phalacrocorax pygmies*)

One individual was recorded twice in June in an irrigation canal a long distance east of Wind Farm and in the Komara dam lake. The species uses the riparian areas, streams and irrigation canals of the region as its habitat. Movements of waterfowl individuals to and from these locations on water surfaces with flights over rural locations are frequent.

The project does not affect the genre.

At National level No favorable reference prices (FRPs) have been set. For the SPA area GR1110008, an ETA value has NOT been set, but a spread of 259.31 km^2 .

3.6.7. Nuisance effects

The nuisances that may cause effects on the species of the area where the Wind Farm is to be installed during their operation stage, refer mainly to the noise produced by the rotational movement of the blades of the W/Ts and the visual disturbance from the presence of the W/Ts and of the personnel moving for the maintenance work in the wind farm, in the species of avifauna that use the area. This type of impact may affect displacement of breeding pairs, due to intolerance of human

activities, reduction of reproductive output or cessation of reproductive effort, change in foraging behavior and displacement to adjacent areas (partial displacement), up to complete abandonment of territory by certain species that do not tolerate human presence at all (complete displacement). Consequently, the breeding population of these species and their conservation objectives (ie ETA values) may be affected. Displacement (partial or total) in birds of prey as an effect of disturbance has been studied internationally and there is a dichotomy among scientists about its magnitude (Langston & Pullan 2003, Madders & Whitfield 2006). In some cases it has been found that some species, while using the area before the construction of the wind farm, exhibit avoidance behavior after its installation. In other studies from before-and-after the construction of wind farm, no significant effects have been found and in fact some species appeared in the areas where the Wind Farm were made, while they did not exist before their construction. The movement of the blades and the noise from the operation of the W/Ts in the short term may cause the displacement of some species, but in the long term these species may become accustomed to the presence of the W/Ts and use the area as before the construction of the wind farm.

In a study - monitoring program done by the study group at Wind Farm in Sidirokastro P.E. Serres, Aetogerakina and Gerakina were found to be quite tolerant of the presence of W/T and were observed to pass through the risk height zone of W/T collision that were close to active territory, but no collision was recorded.

Also, there are not expected to be any significant nuisance effects from the operation of the Wind Farm under study on other species of predators that occur during migratory movements or during wintering, because these are observed as random visitors by individuals. For ostriches and small-sized birds, the information from the international literature is minimal. The operation of the Wind Farm under study is not expected to displace small and medium-sized avian species, as the area displaced from suitable foraging habitats for these species is considered "negligible". In conclusion, no significant effects of disturbance during the operation of the Wind Farm under study are expected for the above species on their populations or on the distribution range and fragmentation of their habitats, and therefore the conservation objectives of these species are not expected to be affected.

3.6.8. Summary of impacts on fauna and avifauna, during the construction and operation phase of the Wind Farm at the Aetokorfi location

The effects of the construction of Wind Farm on the fauna and mainly on the birds from the installation and operation according to the EU are as follows:

- Nuisances during construction that are temporary and permanent impacts.

- Avoidance of large areas around relevant infrastructure such as transmission lines may be observed.
- Displacement of nest sites for larger predators may be observed.
- Impact on the blades and tower of the W/T and killing of bats , waders and predatory bird species.
- It is likely to lead to increased presence of people and human activities in the area and road traffic.
- Species familiarity cannot be taken for granted as it depends on variations by species, sex, age, individual, season and type of disturbance, as well as the frequency and predictability of disturbance.
- The accumulation of many small effects can be significant at the population level.

For the Wind Farm under study, we report the following conclusions:

Construction phase

The construction works of the Wind Farm and the continuous anthropogenic presence during the construction period are expected to result in the disturbance of the species of fauna that include the construction sites in their habitat. During the construction of the works, there will be a partial displacement of fauna species from the construction sites. This implies that the places are not used by fauna species. However, some nocturnal species with good adaptability to human presence (fox) will visit construction sites during the night in search of food scraps.

The main disturbance to fauna species is related to the increased noise levels during the construction phase. The effect of sound on animal species causes the species to move away from the sound emission sites. This is a normal reaction to avoid danger. **This displacement is partial and does not cause significant effects on the biology of the species nor does it permanently affect the hearing of the fauna species.**

Operating phase

During the operational phase, the vibration-like noise emits at low frequencies and will significantly affect terrestrial populations within a radius of 500 – 1,000 m . The effect of sound on animal species causes the species to move away from the sound emission sites. This is a normal reaction to avoid danger. **This displacement is partial and bird biology will not be affected unless the effects work synergistically, nor does it permanently affect the hearing of the fauna species.**

During the operation phase of the wind farm, the chances of collisions on the blades and towers of the W/Ts increase, mainly to the larger species of avifauna and especially to the raptors and

bats. The factors affecting the risk of collision are related to : weather conditions, altitude, exposure, topography, length of W/T blades, height of W/T mast, number of wind turbines in the site unit, type of the bird, the age of the bird, the life cycle stage it is in, the number (ETA) and relative abundance, flight behaviour, flight behavior during migration and the availability of prey in the Station area.

3.6.9. Anticipated nuisances from associated projects and facilities – Synergistic effects

The wind farm under study of the company ANEMOS EVROU M.I.K.E. has been sited in an area where there is a low density of Wind Farm in operation, or licensed for production, or under evaluation. We report that substantial synergistic effects need to be analyzed for licensed and licensed plants that have completed most of the steps in their licensing and are almost certain to be built. For the projects under evaluation there is a possibility of their non-licensing. The projects depicted in figure 2-6 and analyzed below have been taken from the RAE map version 09/2022.

In the area there are the following RES projects.

- At a distance of up to 10 km , there are 42 wind turbines with a PRODUCTION LICENSE and they are located as follows:
  - to the north and east of the project 22 W/T of the company AEOLIKI TRIGONOU MIKE (22)
  - to the north 9 W/T of the company TERNA ENERGY ANONYMI VIOMICHANIKI EMPORIKI TECHNIKI ETERIA S.A. (9),
  - in the southwest 11 W/T of the company GREEN VOLT M. I. K. E. (11).

  Within a radius of 10 Km, projects with an operating permit and an installation permit are not sited.
- At a distance of up to 10Km, the following PV projects are located:
  - To the east-northeast at the location of Pentalofos - Spilaio PV of 99.99 MW of the company AEOLIKI TRIGONOU I.K.E.
  - In the north-east at the location Trigono - Spilaio PV with a power of 105.00 MW of the company TERNA ENERGY ANONIMI VIOMICHANIKI EMPORIKI TECHNIKI ETERIA S.A.

Most of the above projects were located within rural areas. The siting of the above wind energy projects, including the one under study, is done with long distances between them and preventing the accumulation of many technical projects in the space unit. Regarding the concentration of PV Stations, the same is not true, as the concentration in the area unit is high in the area of the Triangle.

The eventual construction of all the above projects cannot create significant negative effects on the natural environment of the study area. The zoning of Wind Farm projects is very sparse in distances between projects (>3 Km) and zoning has not been done in consecutive rows, creating the barrier effect. The synergistic effect of Wind Farm projects is estimated to be small.

The PVs are placed in agricultural crop lands and it is estimated that the change of use from intensively cultivated lands will contribute positively to the recovery of the lands from long-term intensive cultivation and the application of bad practices such as the reckless use of pesticides and fertilizers. Also, an increase in the population and diversity of invertebrates, small rodents and mammals is expected with a directly consequential beneficial effect on predators (birds and fauna).

Finally, in terms of the socio-economic environment, there will be an improvement in the indicators and the standard of living, at the local and regional level, due to the response to the evolving trend of the National and European goals in relation to Renewable Energy Sources. Nevertheless, there must be constant information about the projects to be implemented and interventions of any kind in the area of interest, as the cumulative effects may be irreversible for a long period of time, in terms of environmental factors and environmental criteria (atmosphere, soil, fauna , flora). And there must always be a compromise with the conservation objectives established for each of the protected species of the protected areas .

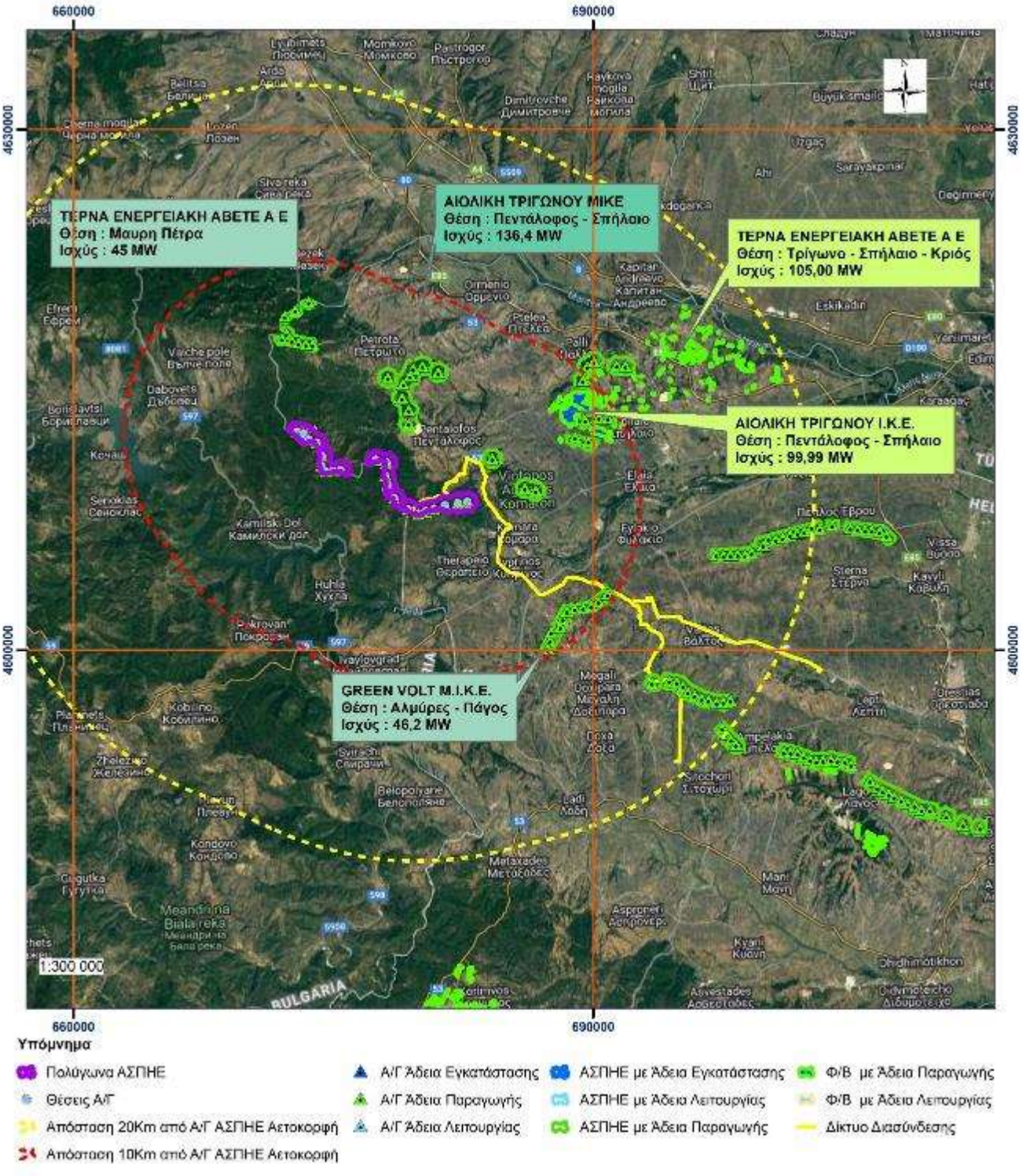

Figure 3-9: The location of the Wind Farm at the "Aetokorfi" location in relation to the licensed RES, Wind Farm projects (RAE source, received on 20/11/2022).

4. MEASURES TO ADDRESS THE POSSIBLE IMPACTS

From the due assessment and evaluation of the impacts arises the need to ensure the balance of the ecological functions of the protected species of birds, fauna, habitats and habitats of the species of Annex II, by taking effective measures and conditions during the design and implementation of the proposed project. The measures and conditions proposed to prevent and reduce the extent of the impacts are recorded and documented below.

4.1. RECORD OF MEASURES, TERMS, RESTRICTIONS

4.1.1. Measures to Cope with Impacts on Habitat Types & Flora Species

Construction phase

The countermeasures proposed during the construction phase to reduce the expected impacts on flora species and habitat types are as follows:

- ✓ Documented and detailed planning of earthworks related to the construction. In more detail:
  - Rational organization of the construction site in order to prevent and avoid impacts.
  - Appropriate disposal of excess excavation products on the slopes in order to minimize the disturbance of the neighboring vegetation and rational redistribution, especially of the upper layer of the soil, which, by preserving a significant percentage of viable seeds and valuable indigenous plant materials, can be a key source for the restoration of vegetation . Therefore, the surface layer of soil that is removed should be carefully stored (separate from the deeper layers).
  - Taking appropriate measures to minimize the dust emitted during the earthworks and their transport (by wetting the temporary storage areas and covering their transport vehicles).
  - Protection of surface water (the seasonal waterholes adjacent to the project site) and the natural environment of the area, which can significantly limit the risks of temporary or permanent environmental degradation (do not dispose of rubble, lubricants and other waste or refuse in an uncontrolled manner in any location, removing a layer of surface soil in places where it has been impregnated with mechanical oils, lubricants, liquid fuels, etc.).
  - Litter and other waste materials should be stored and disposed of appropriately to minimize the potential risk of destroying or contaminating species' habitats.
  - Taking fire protection measures in the event of a fire during the operation of workshop machinery etc. to eliminate the risk of spread in the event of a fire accident.
- ✓ Documented and detailed planning of earthworks related to the placement of frames and infrastructure. In more detail:
  - All of the above apply.

- In any case, the natural process of restoring habitat and species populations is recommended, as well as subsequent reduced intervention that will include invasive species control and monitoring and surveillance of progress.

Operating phase

During the operational phase of the project, there are no reasons to propose countermeasures concerning the types of habitats and habitats, as no impact on their ecological functions is expected.

It goes without saying that the deforested areas of forests and woodlands that will not be covered by operational facilities of the wind farm, should be restored with species of native flora and with species that previously existed in the area.

4.1.2. Measures to Cope with Effects on Fauna and Avifauna

Construction phase

• A key measure proposed to minimize the impact on the avifauna during the construction phase of the Wind Farm is the organization and execution of the works at a time of year **EXCEPT the breeding season, which for most species lasts from mid-February to the end April.** In this way, a part of the bird fauna and its normal activity in the project area is protected. In the case of removal and permanent abandonment of items due to nuisance, there are no countermeasures.

• It is proposed to carry out field work in order to locate and identify woodpecker nests before the start of construction work. In the case of locating nesting sites in dead trees in the work zone, it is recommended to delay intervention in the specific areas until the completion of chick development and feather development, when they can be removed from the nests.

• The planning of the projects should ensure the shortest time of their stay in the area of execution of the works in order to reduce the consequences of noise and dust emissions.

• Vehicles should be driven at low speed within the areas and vehicle movements should be kept to a minimum.

• Workplace lighting should ideally be limited to areas required for work and safety. It should also be directed downwards in such a way as to minimize light spilling outside the work area.

Operating phase

During the operation phase of the Wind Farm, a series of measures are proposed, which in principle concern the minimization of the possibility of collisions with birds and cheiropters as follows:

• Sealing of control room doors and windows.

• Keeping the area of the Wind Farm clean and the immediate removal of carcasses of dead animals which are likely to attract scavenging birds from greater distances .

• Elaboration of a special program for recording expected mortality with the application of a specific protocol. It is recommended that the check be done by an expert. A forester of the institution, or of the Directorate of Forestry, or of the Forestry Office, or by an authorized person from above (Monitoring Program).

• Installation of a detection system (in each W/T) of avian species, through the appropriate algorithms and cameras, analysis of the flight path and timely reproduction of the appropriate sound pattern to repel the bird and avoid collision with the blades or the tower of W/T.

• The tracking systems should have the possibility of stopping the rotation of the W/T in the event that a bird does not move away with the sound signals.

• During the construction phase and for a period of at least 2 years from the operation of the wind farm, a monitoring program of the effects on avifauna will be drawn up and annual reports will be submitted to the Management Unit of the area and the competent services.

• Due to the impossibility of detecting birds in conditions of dense fog and low cloudiness that often prevail in the location, it is recommended to install thermal cameras in the detection and stopping systems of W/Ts.

• It is proposed to place special system detection cameras in an additional row in a horizontal vieblade position in order to detect flights of species that ascend from lower altitudes and the slopes on either side using thermal currents and cannot be detected by the cameras aimed upwards .

• It is recommended to paint the blades with colors that repel the attraction of birds or be noticed in time. In Kaliarka, Bulgaria, in the SNWF park , coloring the tips of the blades with red color had positive results in reducing the incidence of collisions.

• Implementation of a training program for the Wind Farm staff by specialist scientists or under the responsibility of the Management Unit of the area regarding the required actions in case of detection of a dead or injured bird.

Monitoring Program

The project owner will implement a program to monitor the effects of the Wind Farm on the avifauna and at the same time record the species of the avifauna in order to control the operation of the Wind Farm under study and interventions with the aim of minimizing or completely eliminating the effects of the operation of the Wind Farm on the avifauna of the area. As part of this program, an impartial recording of live or dead carcasses of species found near the project under study will be carried out.

The monitoring program will be designed and developed by specialized scientists and trained personnel in collaboration with the Management Unit overseeing the area.

Deinstallation phase – removal of equipment

A key measure proposed to minimize the impacts on the avifauna during the phase of de-installation and removal of the individual parts of the wind farm's W/T, after the end of their operation, is the organization and execution of the works at a time of the year outside the breeding season period, which for most species lasts from mid-February to the end of April. In this way, a part of the bird fauna and its normal activity in the project area is protected. In the case of removal and permanent abandonment of items due to nuisance, there are no countermeasures.

4.1.3. Countermeasures regarding Water Resources

- Excavation products should not be deposited in streams and rivers to ensure the free flow of their waters, as well as in forested areas beyond the project occupation zone.
- Particular attention should be paid during the work of opening roads and construction of W/T squares and especially in excavations in stony places in order to avoid injury to rock veins that affect karst water sources at lower altitudes.

4.1.4. Countermeasures regarding Liquid Waste

- It is forbidden to burn materials of any kind in the project area, as well as to dispose of used mineral oils on the ground. The change of the used mineral oils should be done in a specific area, in which there is a provision to avoid soil pollution with a cement layer and a network for collecting the leaks. The management of used mineral oils should be done in accordance with the provisions of Greek Decree 82/2004 (Government Gazette 64/A/04).

4.1.5. Countermeasures regarding Solid Waste

- The trucks used to transport the materials and parts of the wind turbines, to have their load fully covered and to travel where possible on roads that do not pass through settlements. The contractors who are responsible for the transport of the materials are obliged to collect any leaks from their transport vehicles along the route to and from the construction sites.
- The solid waste that may come from the use - replacement of consumable materials falling under alternative management, such as tires of wheeled machinery, used batteries and accumulators, packaging materials of consumables, etc., should be collected and made available for recycling , in accordance with the requirements of the existing legislation (Law 2939/01 and the decrees issued pursuant thereto).
- Non-hazardous solid waste (old spare parts, machinery, etc.) to be collected and removed. Their disposal should be carried out, in accordance with the provisions of JMD 50910/2727/03 (Government Gazette 1909/B).

- The collectors - transporters who will receive the above waste should be properly licensed according to the applicable legislation.
- Materials contaminated by hazardous waste, to be collected separately in special bins and made available to companies that have a relevant license for the management of hazardous waste, in accordance with Government Decree 13588/725/2006 (Government Gazette 383/B/06).

The loading, transport and storage of products and sterile materials should be done in a way that avoids environmental pollution

4.2. METHOD OF MONITORING AND POSSIBLE REVISION OF EACH PROPOSED MEASURE

The monitoring of the facilities must be done with cameras, while the observance of the Environmental conditions by implementing an environmental monitoring program.

The project owner will implement a program to detect and monitor the effects of the Wind Farm on the avifauna and at the same time record the species of the avifauna in order to control the operation of the Wind Farm under study and the interventions with the aim of minimizing or completely eliminating the effects from the operation of Wind Farm in the avifauna of the region.

The monitoring program will be designed and developed by specialized scientists and trained personnel in collaboration with the Management Unit that oversees the area.

In cases where recruitment measures are disputed, their revision will be made after a collective decision and approval of the Management Unit, OFYPEKA, the Forest Coordination & Inspection Directorate and the Forest Protection Directorate of the General Directorate of Forests and Forest Environment of the Ministry of the Interior.

5. COMPENSATORY MEASURES

According to the assessment of the state of the natural environment in the construction area of the Wind Farm under study in the "Aetokorfi" location, the negative effects on the conservation status of habitat types and species of flora and fauna are of moderate importance and are dealt with to a large extent by the foreseen measures will be included in the ETD and those proposed in this SEA study. The intervention in the area's flora (oak forest) is considered to have a moderate effect.

It is clear that the wind farm development and installation company must be in direct cooperation with the Supervisory Management Unit and OFYPEKA to monitor the effects of the installation of the projects on bird species and to take protection measures.

6. MONITORING PROGRAM

Upon completion of the construction and operation of the wind farm, a minimum two-year monitoring program of the bird and fauna and the impacts of its operation will be implemented. The program is proposed to follow the general guidelines included in the Joint Ministerial Decision "Definition of measures for special protection and conservation and restoration of species and habitats/habitats of wild birds in special protection zones (SPA)".

The monitoring program will be designed and developed by specialized scientists and trained personnel in collaboration with the Management Unit that oversees the area.

7. SUMMARY OF CONCLUSIONS

Based on the assessment of the conservation status of the types of habitats and species of flora, fauna and birdlife in the research area and the general state of the natural environment in the areas of the NATURA 2000 network (GR 1110008 – Riparian forest of northern Evros and Ardas), it is concluded that the construction of the project:

- ✓ The study area includes 11 types of habitats of Annex I of JMD E.P.14849/853/E103/4.4.2008. The types of habitats concerning the FRA of Wind Farm are 91M0 Pannonian oak forests with Quercus cerris and/or Quercus petraea –, 934A : Greek Forests of Prinos – , 1020 : Agricultural crops - and Bare – barren - roads -. The types of habitats concerning the FRA of the underground interconnection cable are 91M0: Pannonian oak forests with Quercus cerris and/or Quercus petraea –, 3280 : Mediterranean rivers with a permanent flow of Paspalo – Agrostidion and dense curtain-type vegetation of Salix and Populus alba along their banks –, 3260 : Vegetation of Ranunculion fluitantis and Callitricho – Batrachion type springs –, 92C0 : Platanus forests orientalis and/or Liquidambar orientalis –, 1020 : Agricultural crops –, 934A : Greek Prinu Forests –, G 645 : Greek super-Mediterranean moist meadows –, 1050 : Bare barrens, roads – and 92 A 0 : Forests – stands of Salix alba and Populus alba. The installation of Wind Farm will take place mostly in an oak forest and priority habitat types and places with protected species of flora are not affected.
- ✓ The Wind Farm under study does NOT cause a delay in the progress of achieving the conservation objectives of the SPA, the designated species and the avifauna protected by European and Greek legislation, as defined and the taking of the proposed measures contributes satisfactorily to the minimization of the expected impacts.
- ✓ The implementation of the project will be carried out on the condition that a record will be made, a file will be compiled, information will be given to those responsible for the effects on the avifauna and implementation of proposed methods to minimize the possibility of collision on the facilities and in particular on the blades and the towers.
- ✓ The expected mortality due to bird strikes in the W/T of the Wind Farm is considered moderate to low. However, for species such as the black stork, the stork, the black vulture, the vulture and large raptors it is a significant effect due to the small population size and low reproductive rate, with a correspondingly significant effect on the total population in the area. The project operator by taking all the proposed measures will minimize the negative effects on the above species with ultimately little impact on the species.
- ✓ Synergistic impacts with neighboring planned and existing Renewable Energy (RE) projects create moderate impacts on migratory and endemic bird species, most of which are protected. Taking

measures to protect and reduce the effects on predatory and mammalian (bat) species is considered necessary to achieve both the construction of RES projects and the preservation of the birdlife and the role of the area. The siting of RES projects within a radius of 10 km does not intensify the barrier effect and does not have irreversible effects on migratory passages.

- ✓ Habitat fragmentation is of small scale in the short term and of very little magnitude in the long term, as the actual change of use is implemented on a very small scale and outside priority habitats.
- ✓ Changes are not caused in vital parameters (eg nutrient balance, soil degradation from possible erosion, dynamics of relationships between biotic and abiotic parameters), which determine the ecological function and the various ecosystem services in the study area
- ✓ No interactions with predicted or expected physical changes in the study area are caused.
- ✓ The construction and operation of the project in one of the most isolated and population and economic withering areas, contributes to the positive impact on the socio-economic environment and the protection of the forest environment through the continuous presence of Wind Farm staff.

For **OLYMPOS STUDIES COMPANY IKE** ,

Alexios An. Economou

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9. STUDY GROUP

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Researcher **OLYMPUS COMPANY** **OF STUDIES IKE**	DIMITRIOS KONSTANTINIDIS ΟΛΥΜΠΟΣ ΕΤΑΙΡΕΙΑ ΜΕΛΕΤΩΝ Digitally signed by ALEXIOS OIKONOMOU Date: 2022.12.09 21:41:42 +02'00'
Project Company	KONSTANTINOS VASILEIADIS Digitally signed by KONSTANTINOS VASILEIADIS Date: 2022.12.14 12:18:12 +02'00'

DATA SHEETS – FIELD RECORDS

Table of point records of bird species during fieldwork in the FRA and in the wider area

N/A	SPECIES	population	DATE	BEHAVIOR	X EGSA'87	Y EGSA' 87
1	*Sylvia communis*	2	20/4/2021		700919.94	4594265.98
2	*Sylvia communis*	2	20/4/2022		700919.94	4594265.98
3	*Motacilla alba*	1	20/4/2022		705587.94	4607033.52
4	*Alauda arvensis*	1	12/6/2022	KN-AT	682441.69	4610347.19
5	*Lanius collurio*	1	30/6/2022		684483.54	4607484.12
6	*Ciconia ciconia*	25	1/7/2021	FEEDING-HARVESTING	704842.95	4606954.97
7	*Ciconia ciconia*	30	2/7/2021	FEEDING--HARVESTING	704873.64	4606996.25
8	*Ciconia ciconia*	20	2/7/2021	FEEDING--HARVESTING	688009.65	4601206.06
9	*Ciconia ciconia*	20	2/7/2021	FEEDING--HARVESTING	695781.80	4597551.49
10	*Ciconia ciconia*	20	2/7/2021	FEEDING--HARVESTING	701121.11	4593830.11
11	*Ciconia ciconia*	5	2/7/2021	FEEDING--HARVESTING	698824.44	4594333.03
12	*Ciconia ciconia*	8	2/7/2021	FEEDING--HARVESTING	698321.52	4594450.38
13	*Ciconia ciconia*	20	2/7/2021	FEEDING--HARVESTING	703887.17	4593561.89
14	*Ciconia ciconia*	10	2/7/2021	FEEDING--HARVESTING	703518.37	4593679.24
15	*Emberiza melanocephala*	1	2/7/2021		703183.09	4593478.07
16	*Emberiza melanocephala*	1	2/7/2021		702780.75	4593645.71
17	*Garrulus glandarius*	1	2/7/2021		679385.41	4615854.07
18	*Ciconia ciconia*	6-8	2/7/2021	FLIGHT	684475.60	4611027.29
19	*Ciconia ciconia*	10	2/7/2021	NUTRITION	684531.16	4611297.17
20	*Emberiza melanocephala*	1	2/7/2021		686368.70	4603700.57
21	*Alauda arvensis*	2	2/7/2021	PERCH- FLIGHT	685751.56	4609371.92
22	*Coracias garrulus*	1	8/7/2021	PT-CL	676824.16	4610984.83
23	*Erithacus rubecula*	3	9/7/2021	CL-PT	676223.97	4610519.16
24	*Parus major*	1	9/7/2021	KN-AT	674739.66	4610138.16
25	*Upupa epops*	1	7/15/2021		701137.87	4594165.39
26	*Emberiza cirlus*	2	7/15/2021	PERCH - FLIGHT	697147.72	4605393.10
27	*Lanius minor*	1	7/15/2021		699661.26	4606266.23
28	*Galerida cristata*	4	7/15/2021		684050.94	4608250.09
29	*Galerida cristata*	4-8	7/15/2021		686231.12	4604197.99
30	*Lanius collurio*	1	7/15/2021		690232.29	4611715.48
31	*Galerida cristata*	3-5	7/16/2021		701607.27	4594048.04
32	*Melanocorypha calandra*	1	7/16/2021		699714.18	4606028.10
33	*Galerida cristata*	2-4	7/16/2021		679114.21	4614990.86
34	*Lullula arborea*	1	7/16/2021		679487.93	4615298.44
35	*Galerida cristata*	4	7/16/2021		685761.48	4609519.16
36	*Coracias garrulus*	1	7/19/2021	PT	676963.86	4611359.48
37	*Emberiza cirlus*	1	7/19/2021	KN-AT	682124.19	4608164.37
38	*Fringilla coelebs*	3-4	25/8/2021		689851.28	4611842.48
39	*Phoenicurus ochruros*	1	26/8/2021		678257.62	4615377.82
40	*Galerida cristata*	2-4	26/8/2021		680476.81	4615629.17
41	*Galerida cristata*	3-5	26/8/2021		683792.98	4610519.29
42	*Sylvia communis*	2	26/8/2021		685761.48	4609185.79
43	*Galerida cristata*	3-5	26/8/2021		684396.23	4607666.68
44	*Dryocopus martius*	1	8/27/2021	DR-AT	681891.20	4608499.60
45	*Carduelis carduelis*	2	8/27/2021	PT-AT	675782.75	4610445.08
46	*Chloris chloris*		8/27/2021		678132.26	4609771.98
47	*Chloris chloris*	1	8/27/2021	KN-AT	672830.00	4612527.89
48	*Fringilla coelebs*	1	8/27/2021	KN-AT	677789.36	4610152.98
49	*Fringilla coelebs*	3	8/27/2021	KN-AT	672855.40	4612642.19
50	*Emberiza cirlus*	1	8/27/2021	KN-AT	673467.54	4612635.84
51	*Erithacus rubecula*	1	8/27/2021	OK	679848.77	4607608.74
52	*Erithacus rubecula*	1	8/27/2021	KN-AT	681264.30	4607873.33
53	*Galerida cristata*	6-8	8/27/2021	AT-CL	681991.90	4610016.46
54	*Galerida cristata*	2	8/27/2021	KN-AT	683804.30	4608931.66

N/A	SPECIES	population	DATE	BEHAVIOR	X EGSA'87	Y EGSA' 87
55	*Parus major*	2	8/27/2021	KN	677597.16	4610757.29
56	*Carduelis carduelis*	3	10/9/2021	PT-CL	675782.75	4611207.08
57	*Carduelis carduelis*	4	10/9/2021	PT-AT	674900.10	4612134.18
58	*Carduelis carduelis*	2	10/9/2021	AT-CN	675649.40	4610553.03
59	*Cuculus canorus*	1	10/9/2021	OK	675820.85	4609975.18
60	*Coracias garrulus*	1	10/9/2021	PT-CL	672988.75	4612921.59
61	*Turdus philomelos*	1	10/9/2021	CN-PT	677078.16	4610959.43
62	*Chloris chloris*	2	10/9/2021	KN-AT	676595.56	4611124.53
63	*Fringilla coelebs*	2	10/9/2021	KN-AT	675922.45	4610730.83
64	*Fringilla coelebs*	1	10/9/2021	KN-AT	674049.20	4611480.13
65	*Erithacus rubecula*	2	10/9/2021	OK	679160.85	4608256.97
66	*Galerida cristata*	2	10/9/2021	KN-AT	681568.57	4609421.14
67	*Parus major*	2	10/9/2021	AT-CL	674001.47	4611074.79
68	*Dendrocopos major*	1	23/9/2021	DR-AT	678058.08	4612095.19
69	*Dryocopus martius*	1	23/9/2021	DR-AT	682413.75	4608294.54
70	*Cuculus canorus*	2	23/9/2021	OK	675509.70	4610025.98
71	*Coracias garrulus*	2	23/9/2021	PT-CL	674722.30	4610635.58
72	*Turdus philomelos*	2	23/9/2021		676582.86	4611124.53
73	*Chloris chloris*	1	23/9/2021		677376.61	4611353.13
74	*Fringilla coelebs*	3-5	23/9/2021	KN-AT	675738.30	4610737.18
75	*Fringilla coelebs*	2	23/9/2021	KN-AT	675471.60	4610445.08
76	*Fringilla coelebs*	3-5	23/9/2021	KN-AT	673680.90	4611886.53
77	*Fringilla coelebs*	1	23/9/2021	KN-AT	673426.90	4612229.44
78	*Fringilla coelebs*	2-4	23/9/2021	KN-AT	673496.75	4612432.64
79	*Fringilla coelebs*	1	23/9/2021	KN-AT	673642.80	4612343.74
80	*Emberiza cirlus*	1	23/9/2021	KN-AT	675436.04	4610489.53
81	*Lullula arborea*	1	23/9/2021	KN-AT	681335.73	4608137.91
82	*Poecile palustris*	1	27/9/2021		679190.27	4615288.52
83	*Fringilla coelebs*	4-6	28/9/2021		678551.97	4615523.34
84	*Erithacus rubecula*	1	28/9/2021		678998.45	4615136.39
85	*Troglodytes troglodytes*	1	28/9/2021		687744.54	4603615.90
86	*Streptopelia turtur*	2	28/9/2021		686199.37	4604102.74
87	*Erithacus rubecula*	1	28/9/2021		689988.87	4611694.31
88	*Galerida cristata*	2-4	28/9/2021		685222.39	4609710.59
89	*Circus aeruginosus*	1	29/9/2021	PERCH	687365.93	4601007.65
90	*Circus aeruginosus*	1	29/9/2021	PERCH	711402.04	4590077.44
91	*Fringilla coelebs*	2-3	29/9/2021		694756.54	4604546.43
92	*Saxicola rubetra*	1	29/9/2021		679325.87	4615166.15
93	*Buteo buteo*	1	29/9/2021	SEARCH FOR FOOD	679236.58	4614584.07
94	*Turdus merula*	2-5	29/9/2021		679310.66	4613529.04
95	*Cyanistes caeruleus*	1	29/9/2021	PERCH - FLIGHT	686506.28	4604494.32
96	*Dendrocopos syriacus*	1	8/10/2021	DR-AT	680982.22	4608906.74
97	*Dendrocopos medius*	1	8/10/2021	DR-AT	681209.90	4608321.00
98	*Carduelis carduelis*	4	8/10/2021	PT	674950.90	4611422.98
99	*Carduelis carduelis*	3	8/10/2021	PT-AT	678100.51	4609435.43
100	*Turdus philomelos*	2	8/10/2021	PT-CL	677325.81	4611645.23
101	*Fringilla coelebs*	3-4	8/10/2021	KN-AT	677268.66	4611600.78
102	*Fringilla coelebs*	1	8/10/2021	KN-AT	675296.34	4610483.18
103	*Emberiza cirlus*	2	8/10/2021	KN-AT	673886.64	4611549.98
104	*Erithacus rubecula*	1	8/10/2021	KN-AT	681595.03	4609394.68
105	*Galerida cristata*	5-8	8/10/2021	AT-CL	683658.78	4608878.74
106	*Parus major*	1	8/10/2021	AT-CL	673231.53	4612162.23
107	*Buteo buteo*	1	15/10/2021	PERCH	702997.45	4607000.17
108	*Sturnus vulgaris*	4	15/10/2021		697637.20	4605525.39
109	*Erithacus rubecula*	1	15/10/2021	PERCH- FLIGHT	679309.34	4615655.63
110	*Erithacus rubecula*	1	15/10/2021		679310.66	4613612.38
111	*Turdus merula*	2	15/10/2021		685840.85	4609106.41

N/A	SPECIES	population	DATE	BEHAVIOR	X EGSA'87	Y EGSA' 87
112	*Circus aeruginosus*	1	15/10/2021	NUTRITION	688506.54	4603795.82
113	*Phoenicurus ochruros*	2	15/10/2021		687871.54	4603658.24
114	*Turdus merula*	2-3	15/10/2021		686273.45	4604272.07
115	*Sturnus vulgaris*	4	15/10/2021		685945.37	4604324.99
116	*Motacilla cinerea*	1	15/10/2021		685977.12	4603996.90
117	*Phoenicurus phoenicurus*	1	15/10/2021		686252.28	4603848.74
118	*Phoenicurus ochruros*	1	15/10/2021		690189.95	4611673.14
119	*Phoenicurus ochruros*	2	15/10/2021		685121.85	4609752.92
120	*Microcarbo pygmeus*	1	15/11/2021		684286.42	4607150.74
121	*Turdus philomelos*	2	17/11/2021	PT	673357.05	4612280.24
122	*Fringilla coelebs*	1	17/11/2021	KN-AT	674373.05	4611403.93
123	*Fringilla coelebs*	2-4	18/11/2021	KN-AT	675772.59	4610876.88
124	*Motacilla cinerea*	1	20/11/2021		686178.20	4603986.32
125	*Melanocorypha calandra*	6	20/11/2021		685945.37	4604081.57
126	*Buteo buteo*	1	20/11/2021	SEARCH FOR FOOD	685214.45	4609594.17
127	*Circus aeruginosus*	1	21/11/2021	PERCH - FLIGHT	708437.51	4590635.12
128	*Buteo buteo*	1	12/12/2021	SEARCH FOR FOOD	701684.77	4606818.76
129	*Fringilla coelebs*	3	12/12/2021	PERCH- FLIGHT	679474.70	4615949.98
130	*Corvus corone*	2	12/12/2021	PERCH - FLIGHT	684535.13	4607484.12
131	*Corvus corone*	2	12/12/2021	PERCH - FLIGHT	685977.12	4604367.32
132	*Turdus merula*	2	12/12/2021		690369.87	4611948.31
133	*Fringilla coelebs*	2	14/12/2021	KN-AT	675071.55	4610337.13
134	*Erithacus rubecula*	1	14/12/2021	CL-PT	683764.61	4609275.62
135	*Lullula arborea*	1	14/12/2021	KN	681661.17	4609103.64
136	*Turdus merula*	2-4	16/1/2022		679556.72	4612707.51
137	*Erithacus rubecula*	2	16/1/2022		685410.24	4609443.36
138	*Turdus merula*	2-4	16/1/2022		684600.62	4609760.86
139	*Cuculus canorus*	1	20/1/2022	OK	673744.40	4612527.89
140	*Fringilla coelebs*	2-5	20/1/2022	AT-CL	679848.77	4608600.93
141	*Streptopelia turtur*	1	20/1/2022	CN-PT	677906.73	4612178.11
142	*Buteo buteo*	2	5/2/2022	POSSIBLE NEST	701589.55	4606887.51
143	*Corvus corone*	3	5/2/2022	FLIGHT	693392.89	4597937.30
144	*Chloris chloris*	1	5/2/2022	PERCH- FLIGHT	680423.90	4616376.62
145	*Emberiza cirlus*	1	5/2/2022	PERCH - FLIGHT	679326.54	4613937.82
146	*Lullula arborea*	2	5/2/2022		679394.00	4613671.91
147	*Buteo buteo*	1	5/2/2022	SEARCH FOR FOOD	685592.81	4610376.02
148	*Fringilla coelebs*	2	5/2/2022	PERCH- FLIGHT	684562.91	4607734.15
149	*Fringila coelebs*	3-5	5/2/2022		685444.64	4609557.13
150	*Dendrocopos syriacus*	1	12/2/2022	DR-AT	680648.84	4608771.80
151	*Carduelis carduelis*	2	12/2/2022	AT-CN	675763.70	4611016.58
152	*Carduelis carduelis*	5	12/2/2022	PT-AT	677840.16	4610838.78
153	*Dendrocopos syriacus*	2	23/2/2022	DR-AT	677752.97	4611775.42
154	*Picus viridis*	1	23/2/2022	DR-AT	677247.13	4611230.00
155	*Lullula arborea*	1	23/2/2022	KN-AT	676557.35	4611328.79
156	*Lanius senator*	1	25/2/2022		698034.07	4605498.93
157	*Dendrocopos syriacus*	1	3/15/2022	DR-AT	677258.86	4610878.48
158	*Lullula arborea*	2	3/15/2022	KN	674041.16	4611408.17
159	*Dendrocopos syriacus*	1	16/3/2022	DR-AT	681906.94	4608347.14
160	*Picus viridis*	1	16/3/2022	DR-AT	677810.69	4611484.00
161	*Picus viridis*	1	16/3/2022	DR-AT	673058.10	4612686.94
162	*Dendrocopos medius*	1	16/3/2022	DR-AT	676805.11	4611276.93
163	*Galerida cristata*	2	16/3/2022	KN	683658.78	4609751.87
164	*Dendrocopos syriacus*	2	3/17/2022	DR-AT	673571.88	4612032.73
165	*Dendrocopos major*	1	3/17/2022	DR-AT	678373.16	4608609.08
166	*Streptopelia turtur*	1	3/17/2022	CN-PT	681677.05	4609757.16
167	*Falco tinunculus*	1	19/3/2022		679653.30	4614891.65
168	*Turdus merula*	2-4	19/3/2022		684340.66	4610844.73

N/A	SPECIES	population	DATE	BEHAVIOR	X EGSA'87	Y EGSA' 87
169	*Troglodytes troglodytes*	2	19/3/2022		684285.10	4610709.79
170	*Corvus corone*	2-5	19/3/2022	PERCH - FLIGHT	684062.85	4610773.29
171	*Sturnus vulgaris*	2	20/3/2022		702026.37	4593796.58
172	*Upupa epops*	1	20/3/2022		691125.79	4602900.72
173	*Iduna pallida*	2	20/3/2022		700097.83	4606464.66
174	*Sylvia communis*	2	20/3/2022		687546.63	4600230.41
175	*Phoenicurus phoenicurus*	1	20/3/2022		678661.11	4615536.57
176	*Upupa epops*	1	20/3/2022		680199.00	4615510.11
177	*Galerida cristata*	3	20/3/2022		684475.60	4607706.37
178	*Galerida cristata*	2-3	20/3/2022		684467.66	4607634.93
179	*Fringilla coelebs*	2	20/3/2022		684475.60	4607587.31
180	*Galerida cristata*	4	20/3/2022		688294.87	4604240.32
181	*Streptopelia turtur*	2	20/3/2022		685217.10	4609649.74
182	*Fringilla coelebs*	1	11/4/2022	KN-AT	681886.07	4609884.16
183	*Dendrocopos syriacus*	1	11/4/2022	DR-AT	673635.38	4612114.75
184	*Dendrocopos syriacus*	1	11/4/2022	DR-AT	673317.88	4612408.44
185	*Dendrocopos syriacus*	1	11/4/2022	DR-AT	673105.16	4612494.16
186	*Dendrocopos syriacus*	1	11/4/2022	DR-AT	677578.35	4611719.86
187	*Dendrocopos syriacus*	1	11/4/2022	DR-AT	679767.78	4607894.70
188	*Dendrocopos syriacus*	1	11/4/2022	DR-AT	679255.81	4608200.30
189	*Picus viridis*	1	11/4/2022	DR-AT	680303.07	4607689.87
190	*Picus viridis*	1	11/4/2022	DR-AT	675191.31	4610118.75
191	*Picus viridis*	1	11/4/2022	DR-AT	675763.47	4610285.85
192	*Carduelis carduelis*	1	11/4/2022	PT-CN	674074.60	4610730.83
193	*Carduelis carduelis*	2	11/4/2022	PT-CN	673922.20	4611657.93
194	*Cuculus canorus*	1	11/4/2022	OK	673236.40	4612140.53
195	*Turdus viscivorus*	1	11/4/2022	PT	678202.11	4612546.94
196	*Sylvia melanocephala*		11/4/2022		674017.45	4611378.53
197	*Fringilla coelebs*	2	11/4/2022	KN-AT	677986.21	4610165.68
198	*Fringilla coelebs*	3	11/4/2022	KN-AT	675848.79	4610553.03
199	*Erithacus rubecula*	2	11/4/2022	KN-AT	682256.49	4607688.12
200	*Alauda arvensis*	2-3	11/4/2022	KN-AT	676263.66	4611220.31
201	*Lullula arborea*	1	11/4/2022	KN-AT	677422.54	4611598.67
202	*Lullula arborea*	1	11/4/2022	KN	675954.10	4610677.92
203	*Streptopelia turtur*	1	19/4/2022		701394.99	4606679.02
204	*Anthus pratensis*	1	19/4/2022	PERCH- FLIGHT	691199.87	4603429.89
205	*Parus major*	1	19/4/2022		684769.29	4607555.56
206	*Motacilla alba*	2	19/4/2022		690031.20	4611990.64
207	*Galerida cristata*	3-4	20/4/2022		694243.91	4598328.71
208	*Lullula arborea*	1	20/4/2022		693747.81	4598179.88
209	*Fringilla coelebs*	3-8	20/4/2022		693242.01	4598222.29
210	*Phylloscopus collybita*	1	20/4/2022		677844.20	4615771.39
211	*Emberiza melanocephala*	1	20/4/2022		684070.79	4610932.04
212	*Emberiza melanocephala*	1	20/4/2022		684420.04	4610868.54
213	*Motacilla alba*	1	20/4/2022		687691.62	4603764.07
214	*Dendrocopos syriacus*	1	3/5/2022	DR-AT	673711.58	4612095.70
215	*Dendrocopos syriacus*	1	3/5/2022	DR-AT	677844.25	4610418.77
216	*Dendrocopos syriacus*	2	3/5/2022	DR-AT	680176.56	4607942.33
217	*Dendrocopos syriacus*	1	3/5/2022	DR-AT	679795.56	4608311.42
218	*Sylvia melanocephala*	1	3/5/2022	KN-AT	676074.85	4611200.73
219	*Fringilla coelebs*	1	3/5/2022	PT	673407.85	4612331.04
220	*Fringilla coelebs*	3-5	3/5/2022	KN-AT	673994.59	4611391.23
221	*Dendrocopos syriacus*	1	4/5/2022	DR-AT	674589.87	4610365.85
222	*Dryocopus martius*	1	4/5/2022	DR-AT	677929.06	4609088.30
223	*Dryocopus martius*	1	4/5/2022	DR-AT	678147.34	4609789.44
224	*Dendrocopos medius*	1	4/5/2022	DR-AT	673388.80	4612197.68
225	*Sylvia melanocephala*	1	4/5/2022	AT-PT	676347.90	4611245.18

N/A	SPECIES	population	DATE	BEHAVIOR	X EGSA'87	Y EGSA' 87
226	*Chloris chloris*	2	4/5/2022	KN-AT	675027.10	4610819.73
227	*Galerida cristata*	3-4	4/5/2022	KN-AT	682375.55	4610003.23
228	*Galerida cristata*	3-8	4/5/2022	AT	674252.82	4610267.81
229	*Streptopelia turtur*	3	4/5/2022	CN-PT	674231.66	4611384.35
230	*Dendrocopos syriacus*	1	5/5/2022	DR-AT	674344.47	4611043.19
231	*Dendrocopos syriacus*	1	5/5/2022	DR-AT	677586.28	4610947.94
232	*Dendrocopos syriacus*	2	5/5/2022	DR-AT	677143.11	4610802.41
233	*Picus viridis*	1	5/5/2022	DR-AT	678111.65	4610623.19
234	*Cuculus canorus*	1	5/5/2022	OK	673058.60	4611962.73
235	*Turdus philomelos*	2	5/5/2022		672785.55	4612648.54
236	*Emberiza cirlus*	1	5/5/2022	KN-AT	674324.79	4611429.33
237	*Emberiza cirlus*	2-3	5/5/2022	KN-AT	678052.25	4612350.09
238	*Fringilla coelebs*	3	5/5/2022	KN-AT	681277.53	4609130.10
239	*Fringilla coelebs*	2	5/5/2022	KN-AT	678750.75	4607979.16
240	*Cyanistes caeruleus*	1	14/5/2022	PERCH - FLIGHT	679372.18	4615496.88
241	*Coracias garrulus*	1	14/5/2022	PERCH CABLE	688495.95	4603965.15
242	*Sylvia communis*	1	14/5/2022		686104.12	4603943.99
243	*Carduelis carduelis*	2	5/15/2022	PERCH- FLIGHT	690406.12	4602710.22
244	*Streptopelia turtur*	2	5/15/2022		677867.36	4615801.15
245	*Dendrocopos syriacus*	1	12/6/2022	DR-AT	674259.80	4610691.29
246	*Dendrocopos syriacus*	1	12/6/2022	DR-AT	681240.19	4608938.49
247	*Picus viridis*	1	12/6/2022	DR-AT	679355.86	4607610.50
248	*Picus viridis*	1	12/6/2022	DR-AT	672857.68	4612256.59
249	*Dendrocopos medius*	1	12/6/2022	DR-AT	677001.96	4611289.63
250	*Carduelis carduelis*	4	12/6/2022	PT-CN	674163.50	4611721.43
251	*Sylvia melanocephala*	1	12/6/2022	KN-AT	674011.10	4611499.18
252	*Chloris chloris*	1	12/6/2022		674080.95	4611283.28
253	*Streptopelia turtur*	2	12/6/2022	CN-PT	681510.36	4609312.66
254	*Streptopelia turtur*	2	12/6/2022	CN-PT	676446.22	4611336.73
255	*Streptopelia turtur*	1	12/6/2022	CN-PT	675755.66	4610550.92
256	*Anthus campestris*	2	13/6/2022	KN-AT	674172.66	4610560.35
257	*Erithacus rubecula*	1	13/6/2022	OK	682640.13	4608045.31
258	*Dendrocopos syriacus*	1	20/6/2022	DR-AT	680450.40	4608744.02
259	*Dendrocopos major*	2	20/6/2022	DR-AT	680653.87	4607857.66
260	*Picus viridis*	1	20/6/2022	DR-AT	678654.05	4608539.59
261	*Anthus campestris*	1	20/6/2022	KN	673908.08	4611866.73
262	*Coracias garrulus*	1	20/6/2022	OK	677922.71	4611715.08
263	*Sylvia melanocephala*	1	20/6/2022	KN-AT	675306.50	4610705.43
264	*Fringilla coelebs*	2	20/6/2022	KN-AT	672950.65	4612458.04
265	*Emberiza cirlus*	1	20/6/2022	KN-AT	681700.86	4609011.04
266	*Emberiza cirlus*	1	20/6/2022	KN-AT	682785.65	4610730.83
267	*Erithacus rubecula*	1	20/6/2022	OK	677679.18	4610558.85
268	*Streptopelia turtur*	2	20/6/2022	CN-PT	675541.35	4610709.67
269	*Parus major*	1	6/23/2022	KN	678240.10	4608852.29
270	*Lanius collurio*	1	25/6/2022		694559.76	4598308.38
271	*Lanius collurio*	3	25/6/2022		695292.13	4597473.49
272	*Buteo buteo*		25/6/2022	NEST	697817.14	4595519.19
273	*Melanocorypha calandra*	1	25/6/2022		689812.47	4602544.07
274	*Emberiza melanocephala*	1	25/6/2022		688962.45	4602349.56
275	*Microcarbo pygmaeus*	1	25/6/2022		707212.72	4607079.28
276	*Carduelis cannabina*	2	25/6/2022	PERCH- FLIGHT	696949.28	4605657.68
277	*Lanius collurio*	1	25/6/2022		699396.68	4605882.58
278	*Galerida cristata*	2	25/6/2022		687977.37	4603499.49
279	*Galerida cristata*	3-5	25/6/2022		685714.52	4609461.88
280	*Hippolais olivetorum*	1	26/6/2022		688114.95	4604102.74
281	*Iduna pallida*	1	26/6/2022		686082.95	4603912.24
282	*Saxicola rubetra*	1	26/6/2022		685998.28	4603954.57

N/A	SPECIES	population	DATE	BEHAVIOR	X EGSA'87	Y EGSA' 87
283	*Ciconia ciconia*	200	27/6/2022	FEEDING--HARVESTING	708933.21	4591036.56
284	*Ciconia ciconia*	5	27/6/2022	FEEDING--HARVESTING	709388.82	4590977.82
285	*Lullula arborea*	1	27/6/2022		695434.54	4597783.01
286	*Ficedula semitorquata*	1	27/6/2022		679325.87	4615662.25
287	*Ciconia ciconia*	4	27/6/2022	NUTRITION	680895.78	4613757.80
288	*Ciconia ciconia*	6	27/6/2022	FLIGHT	680824.34	4613535.55
289	*Upupa epops*	1	27/6/2022		685903.03	4604155.65
290	*Ciconia ciconia*	12	30/6/2022	FLIGHT	698656.33	4605542.34
291	*Ciconia ciconia*	1	30/6/2022	NUTRITION	702676.29	4606992.59
292	*Ciconia ciconia*	15	30/6/2022	FEEDING--HARVESTING	695418.00	4597948.37
293	*Emberiza melanocephala*	1	30/6/2022		702344.88	4593578.65
294	*Lanius collurio*	1	30/6/2022		701959.31	4594014.52
295	*Ciconia ciconia*	4	30/6/2022	FEEDING--HARVESTING	705023.20	4593492.75
296	*Lanius collurio*	1	30/6/2022		690120.37	4602911.30
297	*Carduelis cannabina*	2	30/6/2022	PERCH- FLIGHT	679630.15	4616280.71
298	*Galerida cristata*	3-5	30/6/2022		678727.25	4615867.30
299	*Parus major*	1	30/6/2022		678105.48	4615999.59
300	*Chloris chloris*	1	30/6/2022	PERCH- FLIGHT	680890.23	4616518.84
301	*Alauda arvensis*	2	30/6/2022	PERCH- FLIGHT	679382.10	4613152.01
302	*Galerida cristata*	3-5	30/6/2022		679310.66	4613144.07
303	*Galerida cristata*	3-5	30/6/2022		684562.91	4611122.54
304	*Emberiza cirlus*	1	30/6/2022	PERCH - FLIGHT	684626.41	4607619.06
305	*Merops apiaster*	5-8	30/6/2022		685579.58	4609549.20
306	*Upupa epops*	1	30/6/2022		685346.74	4609490.99
307	*Ciconia ciconia*	1	5/7/2022	NUTRITION	702720.30	4607133.66
308	*Phoenicurus ochruros*	1	5/7/2022		693543.77	4598004.36
309	*Saxicola rubicola*	2	5/7/2022		699833.24	4606001.64
310	*Galerida cristata*	1	5/7/2022		706077.42	4606835.08
311	*Galerida cristata*	4-6	5/7/2022		678776.86	4615295.14
312	*Poecile palustris*	1	5/7/2022		679471.39	4615930.14
313	*Sylvia communis*	2	5/7/2022		679390.04	4613370.29
314	*Upupa epops*	1	5/7/2022		679429.72	4612961.51
315	*Saxicola rubetra*	2	5/7/2022		684126.35	4610670.10
316	*Merops apiaster*	15-25	5/7/2022		683800.91	4611154.29
317	*Galerida cristata*	2-3	5/7/2022		686459.98	4609392.16
318	*Lanius minor*	1	5/7/2022		686285.36	4609501.70
319	*Fringilla coelebs*	3-5	5/7/2022		688093.79	4603806.40
320	*Merops apiaster*	20-30	5/7/2022	Nests	683954.40	4611262.53
321	*Merops apiaster*	20-30	5/7/2022	Nests	683946.46	4611246.26
322	*Merops apiaster*	20-30	5/7/2022	Nests	683945.54	4611229.72
323	*Merops apiaster*	20-30	5/7/2022	Nests	683945.14	4611239.11
324	*Anthus campestris*	1	12/7/2022	KN	674027.14	4612058.56
325	*Coracias garrulus*	1	12/7/2022	CN-PT	675033.45	4611188.03
326	*Coracias garrulus*	2	12/7/2022	OK	678068.76	4610356.18
327	*Alauda arvensis*	2	12/7/2022	KN-AT	682243.26	4609778.33
328	*Lullula arborea*	1	12/7/2022	KN-AT	673239.47	4612320.98
329	*Streptopelia turtur*	2	12/7/2022	CN-PT	673969.72	4611281.17
330	*Lanius collurio*	1	22/7/2022		701827.11	4606818.89
331	*Lullula arborea*	1	22/7/2022		701154.64	4594031.28
332	*Saxicola rubetra*	2	22/7/2022		700903.18	4593930.70
333	*Alauda arvensis*	2	22/7/2022	PERCH- FLIGHT	706910.86	4606477.89
334	*Lanius senator*	1	22/7/2022		679173.74	4614521.23
335	*Lanius collurio*	1	22/7/2022		686579.04	4609034.98
336	*Motacilla alba*	2	22/7/2022		684431.95	4607432.52
337	*Upupa epops*	2	22/7/2022		688157.29	4604155.65
338	*Lanius minor*	1	9/8/2022		693450.16	4598229.49
339	*Carduelis cannabina*	1	9/8/2022	PERCH- FLIGHT	680847.23	4615695.32

N/A	SPECIES	population	DATE	BEHAVIOR	X EGSA'87	Y EGSA' 87
340	*Galerida cristata*	3-5	9/8/2022		686063.11	4609050.85
341	*Galerida cristata*	2-5	9/8/2022		684130.32	4608388.99
342	*Fringilla coelebs*	5	9/8/2022		684479.57	4607555.56
343	*Chloris chloris*	1	9/8/2022	PERCH- FLIGHT	686188.78	4604420.24
344	*Circaetus gallicus*	1		PERCH IN A TREE	696154.90	4597007.49

Table of flight records of bird species during fieldwork in the FRA and in the wider area

N/A	SPECIES	DATE	population	BEHAVIOR	FLIGHT HEIGHT (m)
1	*Buteo buteo*	25/6/2022	1	AT-PT	100
2	*Buteo buteo*	25/6/2022	2	AT-PT	50-100
3	*Lanius collurio*	25/6/2022	1	KN	0-30
4	*Circaetus gallicus*	25/6/2022	1	AT-PT	150
5	*Circus aeruginosus*	25/6/2022	1	AT-PT	20-100
6	*Circus aeruginosus*	25/6/2022	1	PT	50
7	*Circaetus gallicus*	25/6/2022	1	AT-PT	150
8	*Circus aeruginosus*	25/6/2022	1	AT-PT	20-100
9	*Buteo buteo*	25/6/2022	1	AT-PT	50-100
10	*Aegypius monachus*	25/6/2022	1	PT	100
11	*Circus aeruginosus*	25/6/2022	1	PT	50-100
12	*Falco tinnunculus*	25/6/2022	1	AT-PT	50
13	*Buteo buteo*	25/6/2022	2	PT	100
14	*Aquila pennata*	25/6/2022	1	AT-PT	150
15	*Falco tinnunculus*	25/6/2022	2	PT	20-100
16	*Falco tinnunculus*	26/6/2022	1	AT-PT	18537
17	*Ciconia nigra*	26/6/2022	1	PT	50
18	*Buteo buteo*	26/6/2022	1	AT-PT	100
19	*Circus aeruginosus*	26/6/2022	1	KN-TR-PT	0-100
20	*Falco tinnunculus*	26/6/2022	4	AT-PT	50
21	*Circus aeruginosus*	26/6/2022	2	PT	100
22	*Buteo buteo*	26/6/2022	1	PT	100
23	*Buteo buteo*	26/6/2022	1	AT-PT	150
24	*Falco Subbuteo*	26/6/2022	1	CN-PT	20-80
25	*Circus aeruginosus*	26/6/2022	1	PT	100
26	*Microcarbo pygmaeus*	26/6/2022	1	KN	0
27	*Circus aeruginosus*	27/6/2022	1	KN-TR-PT	0-50
28	*Circus aeruginosus*	27/6/2022	1	PT	100
29	*Circus aeruginosus*	27/6/2022	1	PT	20-80
30	*Circus aeruginosus*	27/6/2022	1	AT-PT	100
31	*Circus aeruginosus*	27/6/2022	1	AT-PT	50-100
32	*Circus aeruginosus*	27/6/2022	1	PT	50

N/A	SPECIES	DATE	population	BEHAVIOR	FLIGHT HEIGHT (m)
33	*Buteo buteo*	27/6/2022	1	AT-PT	100
34	*Ciconia ciconia*	27/6/2022	2	PT	50
35	*Circus aeruginosus*	27/6/2022	1	PT	50
36	*Buteo buteo*	27/6/2022	1	PT	100
37	*Accipiter nisus*	27/6/2022	1	CN-PT	20-60
38	*Aquila chrysaetos*	14/5/2022	1	PT	200
39	*Buteo buteo*	14/5/2022	2	PT	100
40	*Buteo buteo*	19/4/2022	1	CN-PT	0-50
41	*Circaetus gallicus*	27/6/2022	1	PT	150
42	*Falco tinnunculus*	14/5/2022	1	Mon-Fri	0-50
43	*Apus apus*	5/15/2022	4-6	AT-PT	20-80
44	*Hirundo rustica*	5/15/2022	6-10	AT-PT	50
45	*Hirundo rustica*	5/15/2022	6-10	AT-PT	20-100
46	*Corvus corone*	5/15/2022	2	AT-PT	18537
47	*Falco tinnunculus*	5/15/2022	1	AT-PT	50
48	*Ciconia ciconia*	14/5/2022	1	PT	100
49	*Ciconia nigra*	14/5/2022	1	Mon-Fri	0-100
50	*Buteo buteo*	20/4/2022	1	PT	150
51	*Buteo buteo*	5/15/2022	1	AT-PT	150-200
52	*Falco tinnunculus*	20/4/2022	1	AT-PT	50-200
53	*Falco tinnunculus*	19/3/2022	1	AT-PT	50
54	*Ciconia ciconia*	1/7/2021	1	Mon-Fri	0-100
55	*Ciconia ciconia*	1/7/2021	1	AT-PT	50
56	*Ciconia ciconia*	25/8/2021	1	AT-PT	50
57	*Ciconia ciconia*	19/4/2022	1	AT-PT	50
58	*Ciconia ciconia*	7/16/2021	2	Mon-Fri	0-100
59	*Ciconia ciconia*	25/8/2021	3	AT-PT	50
60	*Ciconia ciconia*	7/15/2021	2	AT-PT	100
61	*Ciconia ciconia*	1/7/2021	1	Mon-Fri	0-50
62	*Ciconia ciconia*	26/8/2021	1	PT	50-150
63	*Ciconia ciconia*	5/15/2022	2	PT	50-100
64	*Ciconia ciconia*	7/15/2021	15-20	TR	0
65	*Ciconia ciconia*	2/7/2021	2	PT	50
66	*Ciconia ciconia*	7/15/2021	1	PT	100
67	*Buteo buteo*	12/12/2021	2	AT-PT	150
68	*Buteo buteo*	20/11/2021	1	AT-PT	100
69	*Circus cyaneus*	15/10/2021	1	Mon-Fri	0-100
70	*Circaetus gallicus*	1/7/2021	2	AT-PT	150
71	*Ciconia nigra*	25/8/2021	1	PT	50-200
72	*Falco tinnunculus*	15/10/2021	1	Mon-Fri	0-50
73	*Falco tinnunculus*	5/2/2022	2	Mon-Fri	0-100
74	*Falco tinnunculus*	19/4/2022	4	AT-PT	20-100

N/A	SPECIES	DATE	population	BEHAVIOR	FLIGHT HEIGHT (m)
75	*Falco tinnunculus*	27/9/2021	1	AT-PT	50
76	*Falco tinnunculus*	19/3/2022	1	AT-PT	100
77	*Falco tinnunculus*	1/7/2021	2	AT-PT	50
78	*Clanga pomarina*	20/3/2022	1	AT-PT	200
79	*Circus aeruginosus*	27/9/2021	1	AT-PT	50
80	*Circus aeruginosus*	29/9/2021	1	AT-PT	10-100
81	*Circus aeruginosus*	28/9/2021	1	AT-PT	50
82	*Circus aeruginosus*	1/7/2021	1	AT-PT	100
83	*Circus aeruginosus*	2/7/2021	1	AT-PT	50
84	*Merops apiaster*	1/7/2021	6-10	AT-PT	18537
85	*Merops apiaster*	5/15/2022	44777	AT-PT	18537
86	*Buteo buteo*	16/1/2022	1	AT-PT	150
87	*Buteo buteo*	5/2/2022	2	AT-PT	200
88	*Ciconia nigra*	7/15/2021	2	PT	50
89	*Ciconia nigra*	25/8/2021	1	PT	150
90	*Ciconia nigra*	20/4/2022	1	PT	200
91	*Ciconia nigra*	26/8/2021	1	PT	200
92	*Ciconia nigra*	2/7/2021	1	PT	150
93	*Ciconia nigra*	20/4/2022	1	PT	100
94	*Ciconia nigra*	7/16/2021	1	PT	100
95	*Gyps fulvus*	22/11/2021	2	PT	150
96	*Gyps fulvus*	25/8/2021	1	PT	200
97	*Gyps fulvus*	5/15/2022	1	PT	100
98	*Gyps fulvus*	15/10/2021	1	AT-PT	200
99	*Aegypius monachus*	20/3/2022	2	PT	200
100	*Aegypius monachus*	12/12/2021	1	AT-PT	100
101	*Aegypius monachus*	28/9/2021	2	PT	200
102	*Aegypius monachus*	20/11/2021	1	PT	150
103	*Aegypius monachus*	5/15/2022	2	PT	200
104	*Aegypius monachus*	5/15/2022	1	PT	200
105	*Aegypius monachus*	7/15/2021	1	PT	200
106	*Aquila chrysaetos*	20/4/2022	1	PT	200
107	*Aquila chrysaetos*	7/16/2021	1	PT	150
108	*Aquila chrysaetos*	25/8/2021	1	PT	200
109	*Clanga pomarina*	20/4/2022	1	PT	150
110	*Clanga pomarina*	5/15/2022	1	PT	100
111	*Clanga pomarina*	2/7/2021	1	PT	200
112	*Clanga pomarina*	26/8/2021	1	AT-PT	200
113	*Clanga pomarina*	7/16/2021	1	AT-PT	150
114	*Clanga pomarina*	19/4/2022	1	AT-PT	200
115	*Circaetus gallicus*	20/4/2022	1	AT-PT	150
116	*Circaetus gallicus*	2/7/2021	1	AT-PT	100

N/A	SPECIES	DATE	population	BEHAVIOR	FLIGHT HEIGHT (m)
117	*Circaetus gallicus*	5/15/2022	1	AT-PT	100
118	*Circaetus gallicus*	7/16/2021	2	AT-PT	50-200
119	*Circaetus gallicus*	2/7/2021	1	AT-PT	100
120	*Circaetus gallicus*	20/4/2022	1	AT-PT	150
121	*Circaetus gallicus*	26/8/2021	1	AT-PT	100
122	*Circaetus gallicus*	1/7/2021	1	AT-PT	200
123	*Circaetus gallicus*	20/3/2022	1	AT-PT	150
124	*Circaetus gallicus*	5/15/2022	1	AT-PT	150
125	*Circaetus gallicus*	26/7/2021	1	AT-PT	100
126	*Circaetus gallicus*	26/8/2021	1	AT-PT	200
127	*Circaetus gallicus*	7/16/2021	1	AT-PT	100
128	*Circaetus gallicus*	2/7/2021	2	AT-PT	200
129	*Circaetus gallicus*	27/9/2021	1	AT-PT	150
130	*Circaetus gallicus*	28/9/2021	1	AT-PT	150
131	*Circaetus gallicus*	25/8/2021	1	AT-PT	150
132	*Circaetus gallicus*	1/7/2021	1	AT-PT	150
133	*Circaetus gallicus*	20/4/2022	1	AT-PT	200
134	*Circaetus gallicus*	19/4/2022	1	AT-PT	150
135	*Circaetus gallicus*	19/4/2022	1	PT	100
136	*Circaetus gallicus*	14/5/2022	1	AT-PT	200
137	*Circaetus gallicus*	7/15/2021	1	AT-PT	150
138	*Aquila pennata*	20/4/2022	1	AT-PT	150
139	*Aquila pennata*	1/7/2021	1	PT	100
140	*Aquila pennata*	14/5/2022	1	PT	50
141	*Aquila pennata*	26/8/2021	1	PT	150
142	*Aquila pennata*	20/3/2022	1	PT	200
143	*Aquila pennata*	15/10/2021	1	AT-PT	100
144	*Aquila pennata*	7/15/2021	1	PT	100
145	*Aquila pennata*	2/7/2021	1	AT-PT	50-100
146	*Aquila pennata*	28/9/2021	1	AT-PT	100
147	*Aquila pennata*	27/9/2021	1	PT	150
148	*Aquila pennata*	5/2/2022	1	PT	50-150
149	*Aquila pennata*	19/3/2022	1	AT-PT	200
150	*Aquila pennata*	5/15/2022	1	AT-PT	100
151	*Aquila pennata*	25/8/2021	1	PT	100
152	*Aquila pennata*	20/3/2022	1	AT-PT	150
153	*Milvus migrans*	5/2/2022	1	AT-PT	20-100
154	*Milvus migrans*	29/9/2021	1	AT-PT	100
155	*Milvus migrans*	15/10/2021	1	AT-PT	150
156	*Milvus migrans*	20/11/2021	1	AT-PT	50-100
157	*Buteo buteo*	28/9/2021	4	TR-KN-PT	0-100
158	*Buteo buteo*	5/2/2022	1	AT-PT	100

N/A	SPECIES	DATE	population	BEHAVIOR	FLIGHT HEIGHT (m)
159	*Buteo buteo*	15/10/2021	2	AT-PT	20-100
160	*Buteo buteo*	21/11/2021	1	AT-PT	100
161	*Buteo buteo*	7/16/2021	2	AT-PT	100
162	*Buteo buteo*	12/12/2021	1	AT-PT	50-150
163	*Buteo buteo*	15/10/2021	1	CN-PT	0-100
164	*Buteo buteo*	19/3/2022	2	AT-PT	100
165	*Buteo buteo*	26/8/2021	1	AT-PT	50
166	*Circus cyaneus*	21/11/2021	1	CN-PT	0-100
167	*Circus cyaneus*	15/10/2021	1	AT-PT	100
168	*Circus cyaneus*	12/12/2021	1	AT-PT	50
169	*Circus cyaneus*	5/2/2022	1	AT-PT	50
170	*Pernis apivorus*	27/9/2021	3	AT-PT	100
171	*Pernis apivorus*	26/8/2021	1	AT-PT	18537
172	*Circus aeruginosus*	18/11/2021	1	CN-PT	0-50
173	*Circus aeruginosus*	8/10/2021	1	AT-PT	100
174	*Circus aeruginosus*	17/11/2021	1	Mon-Fri	0-50
175	*Circus aeruginosus*	18/11/2021	1	AT-PT	100
176	*Ciconia ciconia*	9/7/2021	3	AT-PT	50
177	*Buteo buteo*	12/2/2022	2	AT-PT	100
178	*Buteo buteo*	4/5/2022	1	AT-PT	150
179	*Accipiter nisus*	12/2/2021	1	AT-PT	18537
180	*Accipiter nisus*	17/11/2021	1	AT-PT	50-100
181	*Accipiter nisus*	10/9/2021	1	AT-PT	20-50
182	*Buteo buteo*	20/6/2022	2	AT-PT	100
183	*Falco tinnunculus*	8/10/2021	1	AT-PT	18537
184	*Aquila pennata*	11/4/2022	1	AT-PT	150
185	*Circaetus gallicus*	12/6/2022	1	AT-PT	100
186	*Circaetus gallicus*	8/27/2021	1	PT	200
187	*Circaetus gallicus*	9/7/2021	2	AT-PT	150
188	*Circaetus gallicus*	7/18/2021	1	AT-PT	100
189	*Buteo buteo*	5/5/2022	1	AT-PT	50-150
190	*Buteo buteo*	3/15/2022	2	AT-PT	100
191	*Buteo buteo*	17/11/2021	1	AT-PT	50-150
192	*Buteo buteo*	14/12/2021	2	AT-PT	100
193	*Buteo buteo*	23/9/2021	2	AT-PT	150
194	*Buteo buteo*	5/5/2022	1	AT-PT	200
195	*Buteo buteo*	20/6/2022	1	AT-PT	50-200
196	*Buteo buteo*	12/2/2022	2	AT-PT	100
197	*Buteo buteo*	11/4/2022	1	CN-PT	0-50
198	*Buteo buteo*	12/7/2022	1	AT-PT	100
199	*Buteo buteo*	12/7/2022	1	AT-PT	80
200	*Buteo buteo*	10/9/2021	2	AT-PT	100

N/A	SPECIES	DATE	population	BEHAVIOR	FLIGHT HEIGHT (m)
201	*Buteo buteo*	23/9/2021	1	AT-PT	150
202	*Buteo buteo*	23/9/2021	2	AT-PT	50-100
203	*Buteo buteo*	8/7/2021	1	AT-PT	100
204	*Buteo buteo*	12/6/2022	1	AT-PT	50
205	*Buteo buteo*	20/6/2022	1	AT-PT	150
206	*Buteo buteo*	20/1/2022	2	AT-PT	20-80
207	*Ciconia ciconia*	20/6/2022	3	AT-PT	100
208	*Ciconia ciconia*	8/27/2021	1	AT-PT	150
209	*Ciconia ciconia*	13/6/2022	4	AT-PT	50
210	*Falco tinnunculus*	8/27/2021	1	AT-PT	18537
211	*Falco tinnunculus*	10/9/2021	1	AT-PT	20-80
212	*Falco tinnunculus*	12/2/2022	1	AT-PT	50-100
213	*Falco tinnunculus*	12/2/2022	2	AT-PT	100
214	*Falco tinnunculus*	12/6/2022	3	AT-PT	80
215	*Falco tinnunculus*	20/6/2022	1	AT-PT	50-80
216	*Falco tinnunculus*	12/7/2022	1	CN-PT	0-50
217	*Falco tinnunculus*	10/9/2021	2	AT-PT	20
218	*Falco tinnunculus*	17/11/2021	1	AT-PT	50
219	*Falco tinnunculus*	5/5/2022	1	AT-PT	100
220	*Falco tinnunculus*	7/18/2021	2	AT-PT	50
221	*Falco tinnunculus*	12/6/2022	1	AT-PT	0-50
222	*Hirundo rustica*	20/6/2022	44838	AT-PT	10-100
223	*Aquila chrysaetos*	20/1/2022	1	AT-PT	150
224	*Aquila chrysaetos*	11/4/2022	1	AT-PT	200
225	*Aquila chrysaetos*	5/5/2022	1	AT-PT	200
226	*Aquila chrysaetos*	7/19/2021	1	AT-PT	100
227	*Aquila chrysaetos*	9/7/2021	1	AT-PT	150
228	*Aquila chrysaetos*	23/9/2021	1	AT-PT	200
229	*Aquila chrysaetos*	8/27/2021	1	AT-PT	100
230	*Circaetus gallicus*	11/4/2022	1	AT-PT	100
231	*Circaetus gallicus*	13/6/2022	1	AT-PT	50-150
232	*Circaetus gallicus*	20/6/2022	1	AT-PT	100
233	*Circaetus gallicus*	7/18/2021	2	AT-PT	150
234	*Circaetus gallicus*	13/6/2022	1	AT-PT	50-150
235	*Corvus corax*	14/12/2021	3	PT	20-100
236	*Corvus corax*	8/10/2021	2	AT-PT	50
237	*Aquila pennata*	5/5/2022	1	AT-PT	20-80
238	*Aquila pennata*	12/7/2022	1	AT-PT	50-100
239	*Aquila pennata*	9/7/2021	1	AT-PT	100
240	*Falco subbuteo*	11/4/2022	1	AT-PT	20-60
241	*Accipiter nisus*	5/5/2022	1	AT-PT	18537
242	*Accipiter nisus*	14/12/2021	1	AT-PT	40

N/A	SPECIES	DATE	population	BEHAVIOR	FLIGHT HEIGHT (m)
243	*Accipiter nisus*	17/11/2021	1	AT-PT	22190
244	*Accipiter nisus*	10/9/2021	1	AT-PT	50
245	*Accipiter nisus*	7/18/2021	2	AT-PT	100
246	*Accipiter nisus*	5/5/2022	1	AT-PT	60
247	*Accipiter nisus*	20/6/2022	1	AT-PT	18537
248	*Accipiter nisus*	14/12/2021	1	AT-PT	20-80
249	*Accipiter nisus*	14/12/2021	1	AT-PT	50
250	*Aquila pennata*	8/10/2021	1	AT-PT	150
251	*Clanga pomarina*	5/5/2022	1	AT-PT	100
252	*Clanga pomarina*	20/6/2022	1	AT-PT	100
253	*Clanga pomarina*	12/7/2022	1	AT-PT	150
254	*Clanga pomarina*	8/27/2021	1	AT-PT	100
255	*Lanius collurio*	5/5/2022	2	CN-PT	0-20
256	*Lanius collurio*	20/6/2022	1	CN-PT	15-30
257	*Lanius collurio*	12/7/2022	2	CN-PT	20
258	*Ciconia nigra*	8/27/2021	1	PT	80
259	*Accipiter nisus*	14/12/2021	1	AT-PT	20-50
260	*Accipiter nisus*	9/7/2021	1	AT-PT	0-50
261	*Falco tinnunculus*	14/12/2021	1	AT-PT	50
262	*Falco tinnunculus*	20/1/2022	1	AT-PT	0-60
263	*Falco tinnunculus*	5/5/2022	2	AT-PT	0-50
264	*Falco tinnunculus*	12/7/2022	1	AT-PT	22190
265	*Falco tinnunculus*	23/9/2021	1	AT-PT	20-80
266	*Falco tinnunculus*	8/27/2021	1	AT-PT	20-60
267	*Falco tinnunculus*	9/7/2021	2	AT-PT	18537
268	*Falco tinnunculus*	5/5/2022	1	AT-PT	50
269	*Falco peregrinus*	13/6/2022	1	AT-PT	100
270	*Accipiter nisus*	12/2/2022	1	AT-PT	22190
271	*Apus apus*	12/6/2022	44715	AT-PT	20-80
272	*Apus apus*	20/6/2022	44777	AT-PT	20-100
273	*Apus apus*	12/7/2022	44715	PT	10-100
274	*Circus cyaneus*	17/11/2021	1	Mon-Fri	0-100
275	*Circus cyaneus*	17/11/2021	1	PT	20-80
276	*Circus aeruginosus*	20/1/2022	1	PT	100
277	*Circus aeruginosus*	14/12/2021	1	AT-PT	50-100
278	*Clanga pomarina*	5/5/2022	1	AT-PT	150
279	*Clanga pomarina*	9/7/2021	1	PT	100
280	*Aquila chrysaetos*	13/6/2022	1	AT-PT	150