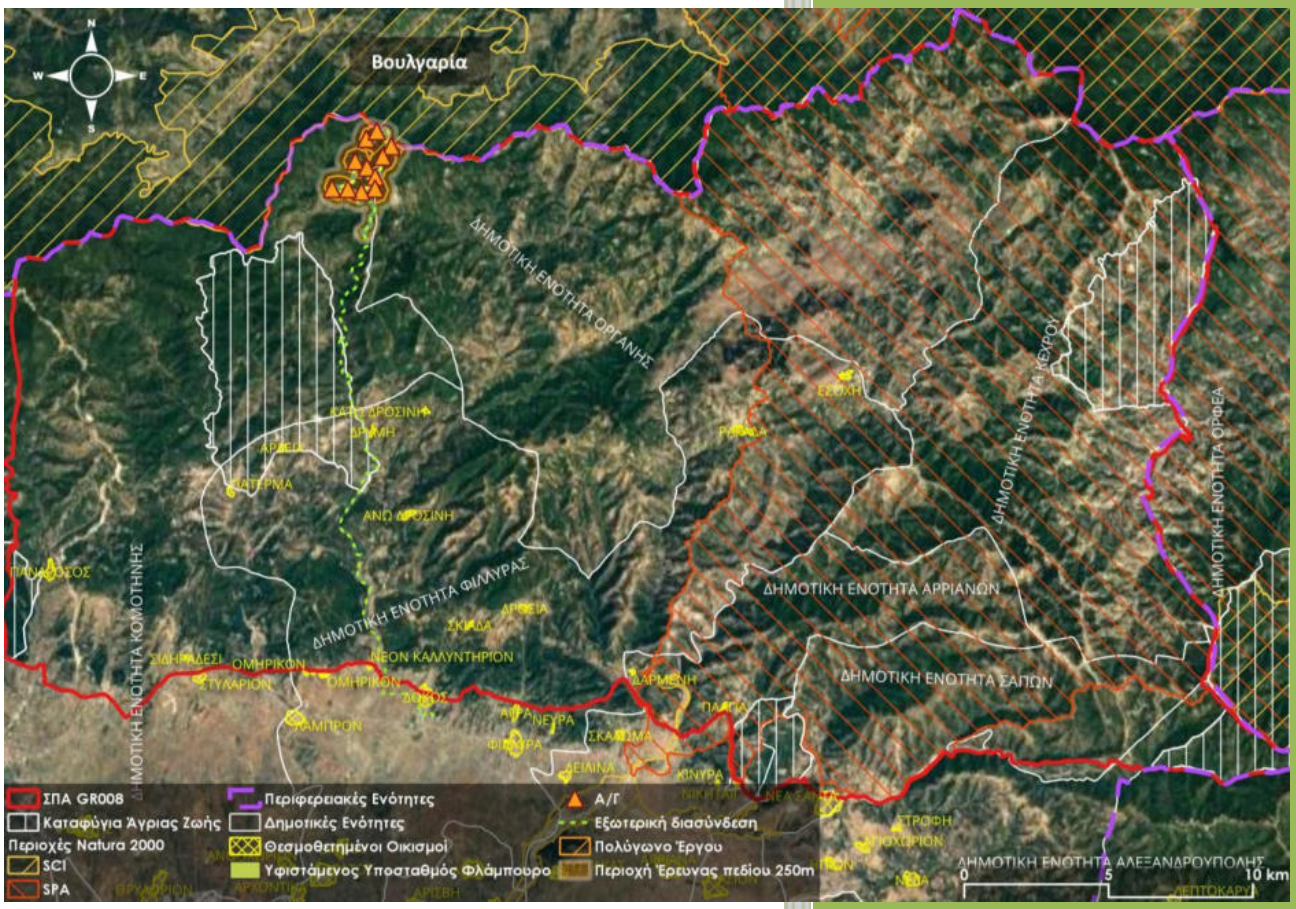
SPECIAL ENVIRONMENTAL ASSESSMENT STUDY (SEA) OF THE SIGNIFICANT AREA FOR BIRDS (SPA or IBA) GR008 'VALLEY OF FILIOURE AND EASTERN RHODOPE' IN THE CONTEXT OF THE ENVIRONMENTAL LICENSING OF A PROPOSED WIND FARM WITH AN INSTALLED CAPACITY OF 44MW AT THE SITE 'POLEMISTES', MUNICIPALITY OF KOMOTINI AND MUNICIPALITY OF ARRIANON, COMOTINI MUNICIPALITY AND ORGANI MUNICIPALITY, RHODOPE MUNICIPALITY, REGION OF



Study Compilation

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1 INTRODUCTION - WEBSITE APPLICATION SPECIAL ECOLOGICAL ASSESSMENT

1.1 Purpose of the Study

The Special Ecological Assessment (SEA) study is a separate part of the EIA for the construction and operation of the Wind Power Plant at the location "Polemistis", Municipality of Komotini and Municipality of Organi, Municipality of Komotini and Municipality of Arrianon, P.E. Rodopi. The objective of the study is to provide a detailed ecological description of the Important Bird Area (BSA) GR008 "Filiouris Valley and Eastern Rhodope" expected to be affected by the construction and operation of the ASPEO and to assess its potential impacts in terms of preserving the ecological integrity of the area. The EIA shall be prepared based on the potential effects of the project on species of importance to the area and, where necessary, shall include the identification of appropriate mitigation measures to ensure that the project will not compromise the integrity of the SPA.

1.2 Legislative framework for the preparation of the EIA for Important Bird Areas

Important Bird Areas (IBAs) are defined as areas of highest priority for the conservation of biodiversity in general and for the protection of birds in particular, which are often irreplaceable or vulnerable as they regularly host significant populations of one or more threatened, endemic or synanthropic species. Overall, they create a coherent global network across the biogeographic distribution of particular species, which can be considered the minimum necessary to ensure their survival in their range. Thus, the network of SPAs is not simply a sum of sites but aims to ensure suitable habitats for breeding, feeding, resting and wintering birds. They have been established by BirdLife International, a global organisation involving over 120 national organisations involved in the protection of birds and their habitats, on the basis of internationally accepted scientific standard criteria (population data, area, etc.). SPPs are now widely recognised by local authorities, national laws and policies, judicial authorities, international agreements and conventions[1] .

In its decision No. 807/2014, the Council of State (CoE), in the context of a lawsuit concerning a request for annulment of the decision No. 49828/12.11.2008 of the Government Policy Coordination Committee in the Sector of Spatial Planning and Sustainable Development (Government Gazette 2464/B/3.12.2008), which approved the Special Spatial Planning Framework for Renewable Energy Sources and the Strategic Environmental Impact Assessment (SEA) prepared in this regard, while the same Section of the CoE, in an earlier decision (No. 1422/2013), postponed the judgment on the legality of Article 6 par. 3 of the contested Specific Framework, in order to allow the Administration to take the actions referred to in that decision, and since the time limit on the part of the Administration had expired, it held that the application in question should be granted in part, and annul the failure of the Administration to incorporate into the contested Specific Framework a provision requiring a **specific ornithological study to be carried out also for areas outside the Special Protection Areas (SPAs) of the Natura 2000 network which are designated as Important Bird Areas**. Further, the CoE ordered the case to be referred back to the Administration,

[1] BirdLife International, Important Bird and Biodiversity Areas (IBAs) - Europe and Central Asia, available at:

in order to adopt, in addition to the provisions of the contested land-use plan, a decision of the competent body providing that, for the siting of wind farms in areas designated as protected areas, a special ornithological study must be carried out.

By means of Decision No. 1542/2017, the CoE ruled that during the environmental licensing procedure for wind farms located in locations outside SPAs, the impact on protected bird species, which are potentially sensitive to the operation of these installations, must be taken into account, in particular if the wind farm to be approved is located in an area of an important migratory bird corridor (migratory flyway), or in a marine area important for birds, **or in a SPA, even if it has not yet been designated as a SPA. The obligation to carry out a specific ornithological study for projects and activities also applies to projects carried out outside an SPA but within a SCI, since the obligation in question derives directly from the provisions of Directive 79/409/EEC, as replaced by Directive 2009/147/EC and in force.**

Directive 2009/147/EC was transposed into the national legal order by means of the following administrative decisions: a) ΚΥΑ Η.Π. 37338/1807/Ε.103/01.09.2010 (Government Gazette 1495/B/06.09.2010) "Determination of measures and procedures for the conservation of wild birds and their habitats/habitats, in compliance with the provisions of Directive 79/409/EEC, "On the Conservation of Wild Birds", of the European Council of 2 April 1979, as codified by Directive 2009/147/EC", and b) KYA H.P. 8353/276/E103/17-2-2012 (Government Gazette 415/B/23.02.2012) 'Amendment and supplementation of Joint Ministerial Decision No 37338/1807/2010 'Determination of measures and procedures for the conservation of wild birds and their habitats/habitats, in compliance with Directive 79/409/EEC...' (B 1495), in accordance with the provisions of the first subparagraph of Article 4(1) of Article 4 of Directive 79/409/EEC of the European Council of 2 April 1979 on the conservation of wild birds, as codified by Directive 2009/147/EC.

The H.P. 37338/1807/E.103/01.09.2010, sets out the relevant provisions for the protection of bird habitats and the protection of species. Articles 4 and 5 and Annex A lay down the relevant provisions for the designation of SPAs. In the SPAs, which are defined on the basis of strict, quantified scientific criteria listed in Annex A, specific protection, conservation and restoration measures (restrictions, prohibitions, etc.) are taken to ensure the survival and reproduction of the protected species in their marine and terrestrial geographical range.

THE CIA 8353/276/E103/17.02.2012 (Government Gazette 415/B/23-02-2012) amends and supplements the above mentioned Decree of 2010, introducing horizontal special protection measures for the implementation of projects or activities within the areas defined as ZEPs, special protection measures for the installation and operation of wind power plants within ZEPs, measures relating to the carrying out of mining activities within an MPA, specific regulations on hunting, agriculture, forestry, fisheries, as well as regulations relating to the threat of poisoned baits. A special Annex to the EIS lists the Greek Special Protection Areas with the corresponding designation species, i.e. the species on the basis of which each specific area is designated as a SPA. In the above EIS and in accordance with Article 5A, it is stated that for the implementation of projects or activities within the

boundaries of Special Protection Zones (SPAs) or in the areas provided for in paragraph 5 of Article 10 of Law No. 4014/2011 (A' 209), the procedure of the Special Ecological Assessment shall be followed during the environmental licensing procedure, in accordance with Articles 10 and 11 (paragraphs 8, 9 and 10) of the same law. The special ecological assessment provided for in paragraph 1 of Article 10 of Law No. 4014/2011, includes mandatory, among other things, specialized ornithological data and information on the species of classification of the SPAs.

For Wind Power Plants (WPPs) within Natura 2000 sites, the specialized ornithological data of Article 5A of the Decree 37338/1807/2010, as amended by the Decree H.P. 8353/276/E103/2012, are collected through a field reconnaissance study. The field reconnaissance study is part of the Special Ornithological Study established by the E.P.H.S.A.A. for RES (Article 6, paragraph 3 of the EIA 49828/2008) and is now part of the Special Ecological Assessment study established by Law 4014/2011.

In view of the above and given that through Articles 10 and 11 of Law 4014/2011 (Government Gazette 209/A/21-09-2011) and the Articles 10 and 11 of the Law 4014/2011 (Government Gazette 209/A/21-09-2011). 1422/2013 and 807/2014 Decisions of the Council of State (CoE), the obligation to prepare a Special Ecological Assessment (SEA) as a separate part of the Technical Description is established for projects of category A2' that are planned or located within an area of the European Network Natura 2000 or within an Important Bird Area even if it has not been designated as a SPA, an SEA study is also prepared for the GR008 SPA following the assessment requirements of the SPAs.

1.3 Compilation of a study

This EIA study follows the provisions of the Law and includes:

· A detailed inventory of the natural environment with emphasis on the conservation elements of the MPA that may be affected by the project; and

· Existing impact assessment

The Existing Impact Assessment aims to analyse and evaluate the estimated impacts with qualitative and quantitative data on:

- of the species of avifauna listed in Annex I to Directive 2009/147/EC and of the Decree 37338/1807/E.103/01-09-2010 (Government Gazette 1495/B/06-09-2010), which was amended
  and supplemented by the Decree H.P. 8353/276/E103/17-02-2012 (Government Gazette 415/B/23-02-2012), as well as all migratory bird species with significant presence in the SPA, in particular in terms of population size and density, their conservation status and isolation; and,

- qualitative and quantitative data on whether the integrity of the sites is ensured.

According to the national legislation, through Articles 10 and 11 of Law 4014/2011 (Government Gazette 209/A/21-09-2011), which establishes the obligation to prepare a Special Ecological Assessment (SEA) as a separate part of the Environmental Impact Study for category A projects planned or located within the area of the European Network

Natura 2000. The specific requirements of the EIA apply to the environmental permitting of the ASPEE, whose description follows, and which is located within the SPA GR008 "Filiouris Valley and Eastern Rhodopes", for which there are no relevant provisions of more specific presidential decrees and ministerial decisions on protection and management.

The present study was prepared by D. Argyropoulos, Civil Engineer-Hygienist, holder of an environmental degree category 27, class C and by Ismeni Gurchoulis - Antoniadou, Biologist MSc. The study team also included ornithologist Dimitrios Voulgaris, who carried out the fieldwork for the avifauna with a team of collaborators and George Giannatos (Environmental Scientist) and Gabriella Papastefanou (Biologist) who carried out the fieldwork for the chrysopters and participated in the writing of the EOA.

In this updated ERA, it is documented that:

- The requirements of the legislation are met in terms of the period and time period of fieldwork, as they include an appropriate time of the year, spring and summer, when migration and breeding of avifauna occur. The total duration of the fieldwork is within the 10-30 day fieldwork requirements, and during the fieldwork a reconnaissance survey of the study area was conducted and species and potential nesting evidence in the study area was recorded.
- The field survey was organised taking into account the species populations, the degree of sufficiency of available data on chironomids and avifauna from literature sources, the knowledge and experience of the researchers about the area, the size, topography and accessibility of the area, the extent and diversity of habitat types (or vegetation).
- Habitat mapping of predator species is carried out.
- Its impact assessment is based on both literature sources and fieldwork data.
- An adequate assessment is made of the cumulative impacts of the project in combination with other existing or planned wind energy projects in the region with a sufficient degree of reliability.

2 DESCRIPTION OF THE PROPOSED PROJECT

2.1 Introduction

The wind farm is being constructed in the location "Polemistis" northeast of the Municipality of Komotini and northwest of the Municipality of Arrianon near the border with Bulgaria. The site was selected after a thorough examination of the area to ensure that it would initially satisfy the data for high wind potential and then taking into account the restrictions provided for in the relevant legislation on environmental protection, existing settlements, spatial criteria and the general activities of the wider area. The proposed wind farm has an **installed capacity of 44 MW and consists of 11 Vestas V-150 wind turbines** with a nominal capacity of 4 MW, a hub height of HH125m and a blade diameter of 150m.

2.2 Key elements of the construction and operational elements of the project

The **total land area of the project will be 3.762 km^2 , with the** total **area of interventions amounting to 140.682 km^2** in total. The Wind Farm (W/P) as a whole is a combination of projects and its construction includes the following:

Underground Medium Voltage Grid - Power and low voltage cable ducts

The internal grid of the wind farm consists of 3 medium voltage circuits. In each circuit the gensets are connected in series to each other, following the layout of the internal road and then to the proposed substation. The **3 underground medium voltage cables**, run in parallel from a point near the entrance of the wind farm. The route follows the access road of the wind farm to a point 1 km north of the village of Neo Kalintiri. From this point the access road and the interconnection are differentiated. The route of the **underground** cables follows existing roads up to the final proposed interconnection point at the existing 20/150 kV Flamburo substation.

The substation will be connected to the existing 20/150kV Flampouro voltage step-up substation in the 150kV heavy duty (B) single circuit (B) Orestiada - Kehros - Kerveros - Iasmos. The length of the internal (new) interconnection is **19.973 m** and the length of the external interconnection is **25.150 m.**

Access road to the A/P and internal roads to the A/P

Access to the A/P site **will be via the existing road network in the area and then the local network, which may require minor improvements to existing roads and/or new roads**. The area of the existing road network to be utilised is **27,877.78 m^2** and the new occupation area required is **90,385.95 m^2** .

Wind turbine erection plaza landscaping

At the location of each A/C, the **installation square** will be formed**, with an area of approximately 4,500 m^2 and a total area of 11 squares of 50,295 m^2** .
the construction of the A/C is carried out. Any irregularities in the ground will be remediated by backfilling.

and appropriate compression to achieve a relatively flat surface.

Table 2.2-1 Land use occupancy of the individual new wind farm facilities

a/a	NAME OF AREA	EMBADON/ LENGTH
1	Wind turbine squares	50.295,88 m^2
2	Surface area of road occupation	90.385, 95 m^2
3	Medium voltage network internal	19.973 m
TOTAL surface area of interventions		**140.681,83 m^2**

3 IDENTIFICATION OF THE STUDY AREA (P.M.) & FIELD SURVEY AREA (F.R.A.R.)

3.1 Study Area (ST)

The study area is considered to be the whole of the Important Bird Area GR0008 called "Filiouris Valley and Eastern Rhodope". The total area of SPA GR0008 is 825.543 km^2 .

Within the boundaries of this SPP, and specifically in its northern part, the wind farm construction project described in the previous chapter is located. The area of the polygon project for its construction amounts to 3.762 km^2 and occupies only 0.46% of GR008. However, only a very small part of the polygon project area will be subject to interventions.

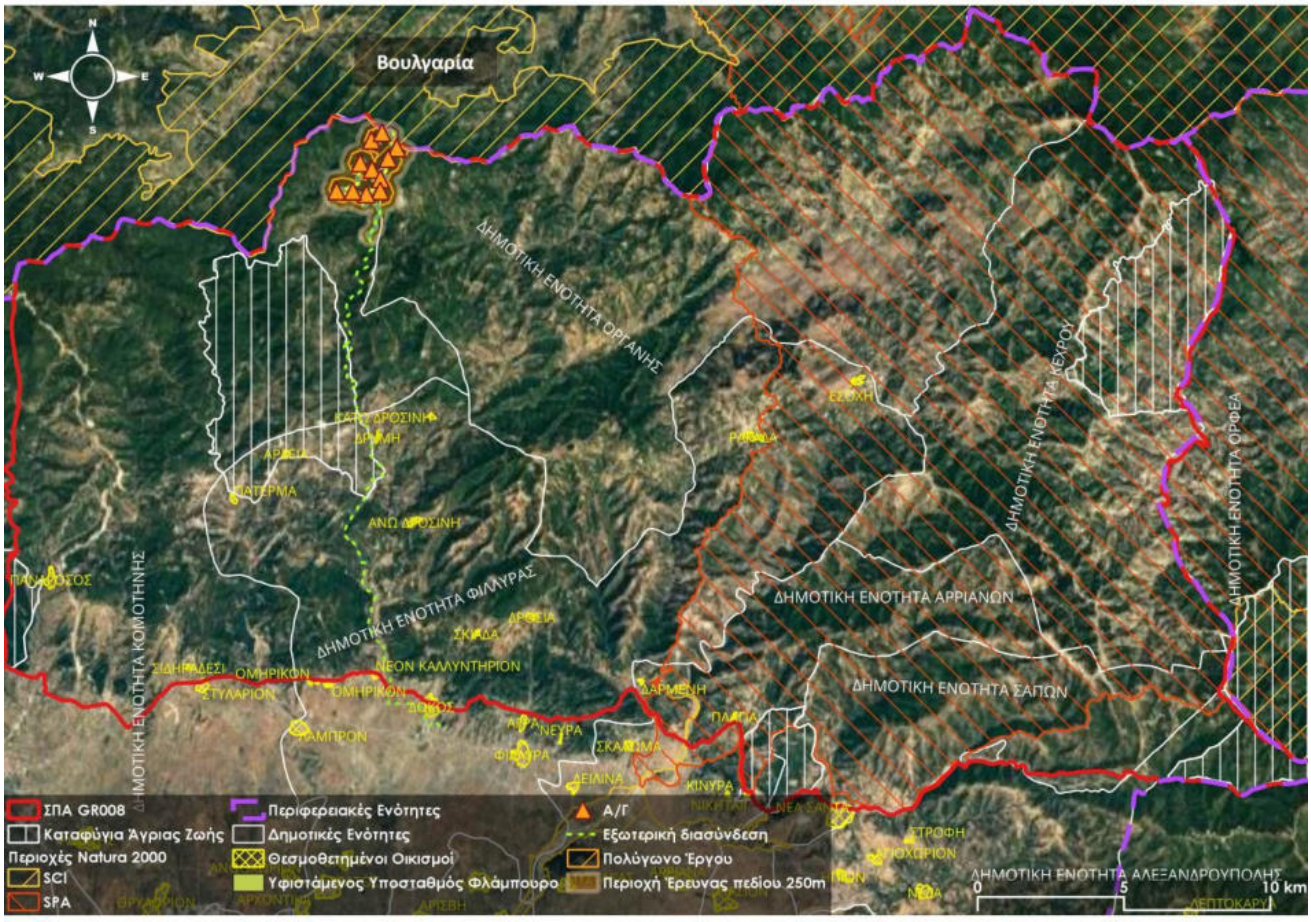

Figure 3.1-1 Schematic illustration of the boundaries of the Study Area (boundaries of the SPA) and the wind farm (orange colour)

3.2 Field Research Area (F.R.A.R.)

The Field Investigation Area (FIA) is defined as the area extending 500m from the boundary of the project site (Class A2) and 250m either side of the linear and point sections of the project. As shown in the figure below, the field survey area extends beyond the borders of Greece, in an area of Bulgaria which is designated as a Natura 2000 Special Conservation Area and is called BG0001032 "Rodopi - Iztochni".

It is noted that the specifications for the EIAs of A2 category projects (such as the one under consideration) require a 10-30 days field survey, which in this case was carried out

in 12 days with a total of 28 recordings covering the relevant specifications and requirements of the legislation.
The EPC occupies the northern part of the SPC.

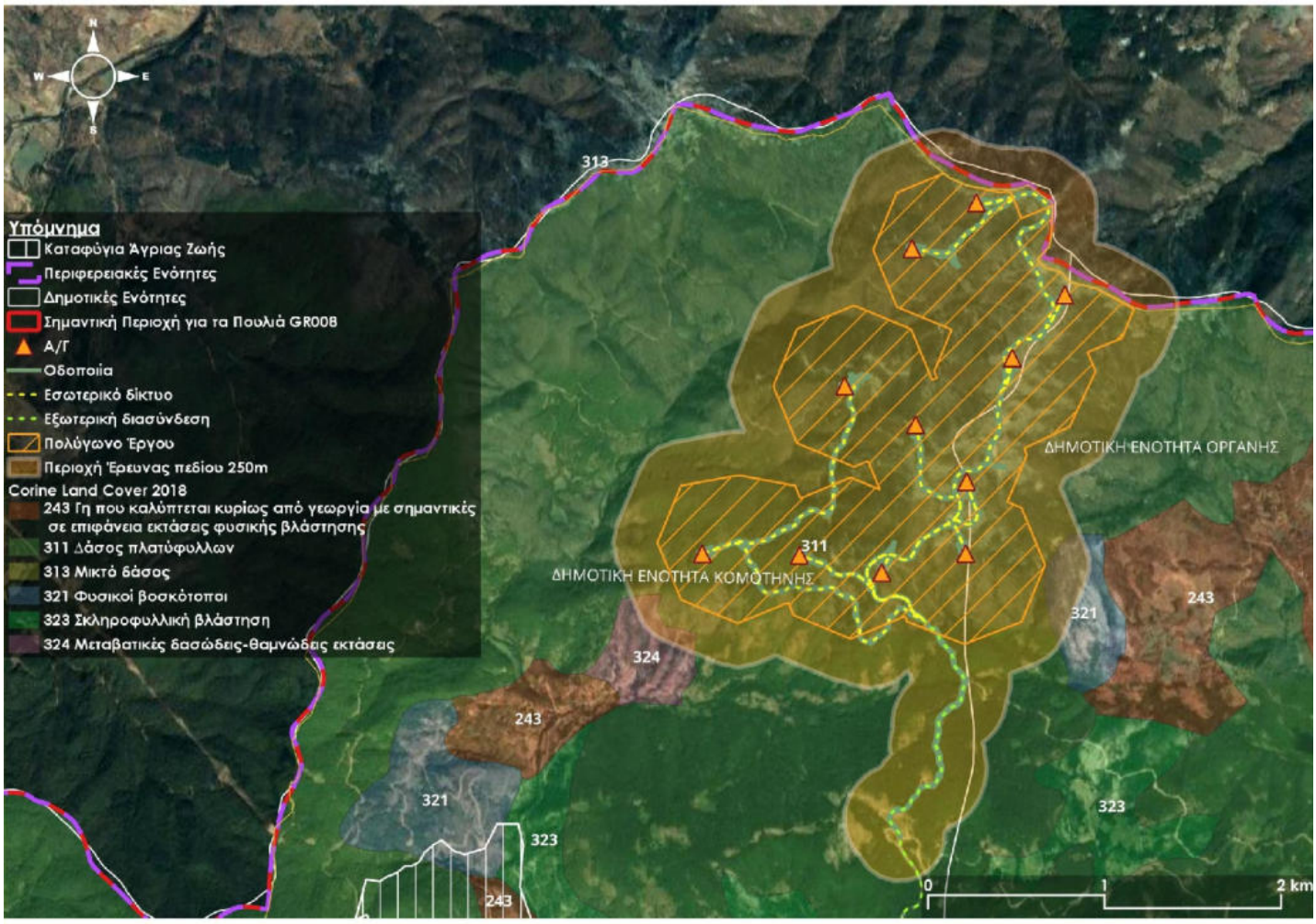

Figure 3.2-1 Schematic illustration of the boundaries of the Field Survey Area (orange) and of the "Warrior" wind farm project site (orange polygon with orange lines)

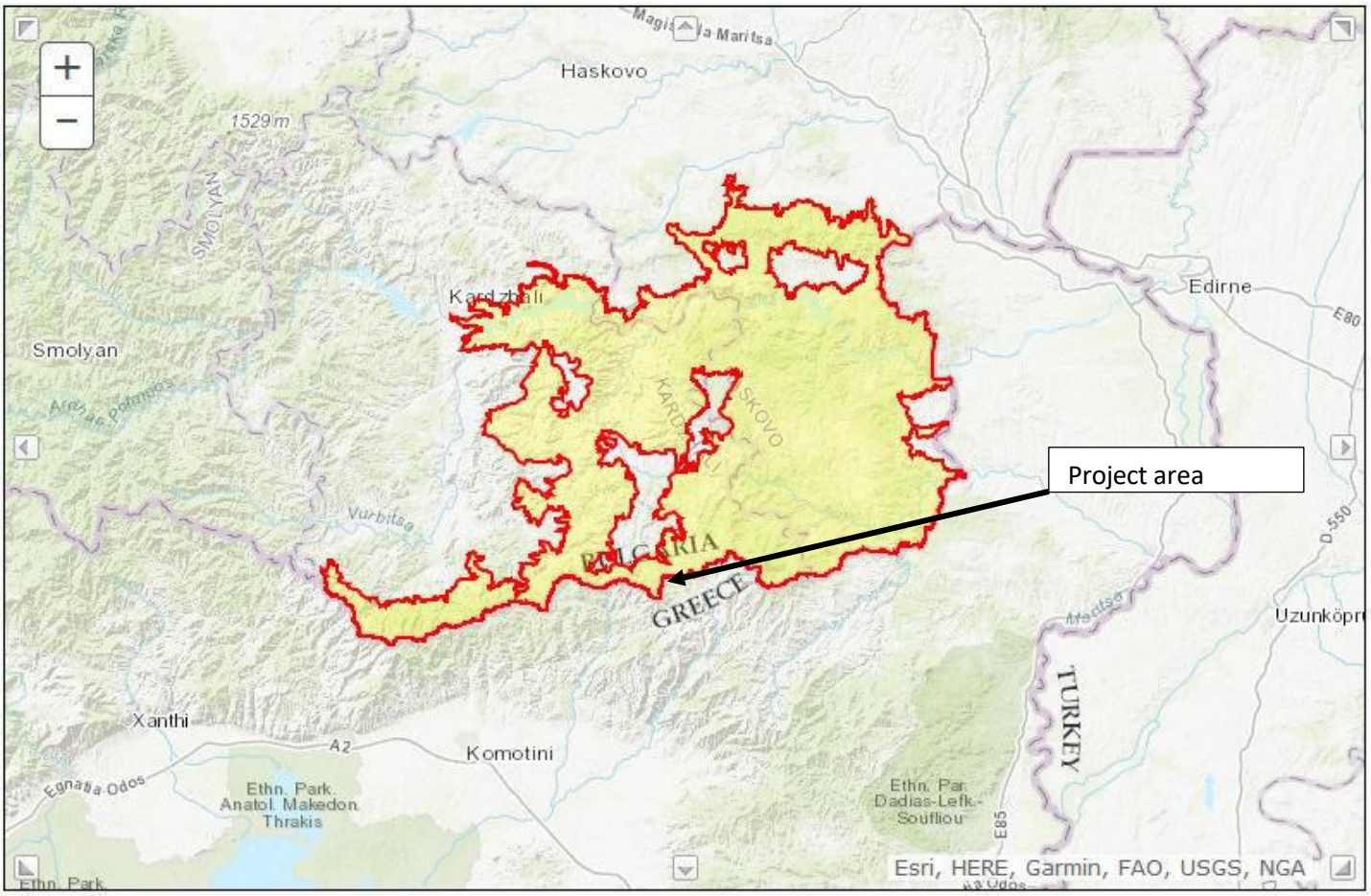

Figure 3.2-2 Illustration of Natura 2000 'BG0001032' "Rodopi - Iztochni" in Bulgaria which is adjacent to the border of Greece and in which a small part of the RPA extends.

(10,52% of the MFF - 0,4m^2) for the project.

4 EXISTING SITUATION OF THE NATURAL ENVIRONMENT

4.1 Inventory and analysis of the elements of the natural environment in the Study Area (S.A.)

4.1.1 Identification and geographical definition of the area

The SPA where the project is located is within the administrative boundaries of the P.E. Rodopi and the Municipality of Komotini and the Municipality of Arrianon. The area encompasses the hills of south-eastern Rhodope and the valley of the river Filiouri. The dominant vegetation is maquis, with scattered clumps of grazing oak (*Quercus* spp.). The isolation of this mountainous area to date has not allowed it to develop (network of forest roads, other types of development and management interventions), so that the character of the landscape has not been altered. The main land uses in the area remain traditional - extensive (agriculture, livestock farming) and contribute to the conservation of biodiversity. It is only in recent years that some infrastructure (e.g. roads) has begun to be created to serve the local population.

Criteria: A1, B2, B3, C1, C6		
Coordinates: 41˚ 13' 3.491" N 25˚ 41' 34.680" E	**Altitude:** 0-1.195 m	**Scope:** 82529 ha
Region: Eastern Macedonia - Thrace		**County:** Rhodope, Evros

For SPA GR008 the habitat types occurring in the SPA GR008 are not available. The percentage of habitat coverage according to data from the Hellenic Ornithological Society is as follows: Forests (36,6 %), Shrublands (33,6 %), Artificial landscapes (19,6 %), Grasslands/Bosque (6 %), Rocky areas (3,8 %), Wetlands (inland) (0,1 %). In more detail, according to the CORINE Land Cover 2018 data, 29.73% of the SPP is covered by Broadleaf Vegetation (323), 27.90% by Broadleaf Forest (311), 16.64% by Land mainly covered by agriculture with significant areas of natural vegetation (243), 7.31% by Coniferous Forest (312), 6.00% Natural Pastures (321), 3,73% from Land with sparse vegetation (333), 2.83% from Transitional shrub-forest land (324), 2.64% from Non-irrigated - arable land (211), 1.81% from Industrial or commercial zones (121), 0.65% from Mixed forest (313), 0.53% from Road/rail networks and adjacent land (122), 0.12% from Grassland (231) and 0.11% from Water collections (512).

4.1.2 Vulnerability of the study area

The main threats that have been recorded in the area are the increasing construction of roads, intensification of forest exploitation (clear-cutting, removal of mature and dead trees), poaching, the use of poisoned baits which creates a significant problem for scavenging predators and, locally, overgrazing. Any installation of a large number of wind farms in the area may have an impact on breeding predators and migratory species passing through the area, as well as on individuals of *Aegypius monachus* that use the area for feeding.

4.1.3 Inventory and protection status of Annex I species of avifauna of Directive 2009/147/EC

For the detailed description of the elements of the natural environment of the GR008 areas, emphasis is given to the avifauna that may be affected by the project under consideration. In particular, an inventory and assessment of the bird species listed in Annex I to Directive 2009/147/EC and their main characteristics is made.

The following table (**Error! Reference source not found.**) lists the presence status and population data of the species of avifauna of the SPA, most of which are covered by Directive 2009/147/EC (former 79/409/EEC), as incorporated into Greek law by Directive H.P.37338/1807/E.103 (Government Gazette 1495/B/2010) and its amendment and supplementation by the Ministerial Decree H.P. 8353/276/E103 (Government Gazette 415/B/23-02-2012) *"Amendment and supplementation of the Ministerial Decree No. 37338/1807/2010 Decree Defining measures and procedures for the conservation of wild birds and their habitats/habitats"*, while in **Table 4.1-2** lists the protection status of the species occurring in SPA GR008 for the whole country and the risk category or not based on the Red Data Book.

Table 4.1-1 Species for the PM in the description form of SP GR008 "Filiouris Valley and Eastern Rhodopes" and their assessment

Species (scientific name)	Species (common name)	Year	Status presence	Plenty	Minimum population	Maximum population	Unit measurement	Accuracy data
Aegypius monachus	Black vulture	2007	non-B		8	0	I	C
Aquila chrysaetos	Golden Eagle	2000-4	R		1	2	P	C
aquila heliaca	(Eastern) Vassal Eagle	2004	U		2	2	I	A
Ciconia nigra	Black Stork	2000-4	B	F				C
Circaetus gallicus	Snake Eagle	1995	B		10	0	P	B
Circus macrourus	Stepocirkos	1995	P	U				B
clanga pomarina	Screamer	2000-4	B		2	3	P	C
Coracia garrulus	(European) Copper pigeon	1995	B	F				B
Dendrocopos syriacus	Balkan Woodpecker	1995	R	C				B
Brown Falco	(European) Curcinezis	1995	P	F				B
Falco vespertinus	(European) Mavrokirkinze	2000-4	P	C				B
Ficedula semitorquata	Oak woodpecker	1990	B	R				C
Gyps fulvus	Vulture	2000-4	B		0	0	P	A
Hieraetus pennatus	Falcon Eagle	2000-4	B	P				C
Lanius collurio	Eagle Eagle	1995	B	C				B
Leiopicus medius	Middle Woodpecker	1995	R	C				B
Neophron percnopterus	Egyptian vulture	2000-4	B		2	3	P	B
Phylloscopus bonelli	Bunophylloscope	1995	B	C				B
Strix aluco	(Common) Humphurist	1992	R	F				B
Sylvia crassirostris	Gingerbread Bear	1993	B	U				B

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Species: scientific name of the species in the taxonomic order according to the Database of the Ministry of Environment (version v.31 2020)

Status of presence: Status of presence of the species in the IBA (BirdLife International's World Bird Database - WBDB categories). Where a species occurs in an IBA with more than one status of presence (e.g. B and non-B), the data are reported on a separate line.

R = Resident: a species that occurs regularly throughout the year (and thus breeds during the appropriate period) in the IBA.

B = Breeding visitor: species that regularly visits the IBA during the breeding season and breeds in the IBA.

non-B = Non-breeding (during breeding season): species regularly visited

the IBA during the breeding season, but does not attempt to breed in it, usually due to breeding failure (or because no breeding is attempted) at other breeding sites, or aggregates at the end of the breeding season, or nests outside the IBA and feeds in that IBA.
W = Non-breeding visitor: species that regularly visits the IBA outside the breeding season. In the case of Europe and B. America this category encompasses the older category 'Wintering visitor', i.e. a migratory species that visits the IBA to 'winter'.
P = Passage visitor: a species that regularly visits the IBA for a relatively short period (or periods) of the year during migration between breeding and wintering grounds.
U = Unknown: The status of the species in the IBA is still unknown.
Ex = Extinct: The species is now extinct from the IBA (used only for species designation that are now extinct from the IBA)
Year: Date of recording related to the population data provided. Where population data are available for a period of time, this is indicated (e.g. 2003-7). Note: '- 1997' refers to species with data prior to 1997.
Abundance: Abundance category of the species in the IBA (WBDB categories). Data are presented in this field only in case no accurate population count is available.
A = Abundant - Abundant: found in large numbers in habitats it prefers
C = Common: found singly or in small numbers in preferred habitats
F = Frequent: often, but not always, found in preferred habitats
U = Uncommon: found sporadically in preferred habitats
R = Rare: rarely observed, this usually indicates less than about 10 records
P = Present: the species is present in the area but it is not possible to estimate its abundance with the available data
Minimum and Maximum Population: estimate the minimum and maximum population of each species in the IBA. If the population size is known exactly, the values for minimum and maximum are identical. If the minimum value is reasonably well known and the maximum value is impossible to calculate, the 'Maximum Population' field is filled in with '0'. If even a broad estimate is not possible, the field 'Abundance' shall be filled in.
Unit of measurement: unit of measurement in which the population was estimated:
P: Breeding pairs
P*: Incubating breeding pairs I: Individuals
I*: Individuals (adults and juveniles)
Data accuracy: possible accuracy of the data (WBDB categories):
A = Good: based on reliable and complete or representative quantitative data (censuses, population monitoring)
B = Medium: based on reliable but incomplete or partially representative quantitative data (censuses, population monitoring)
C = Poor: based on qualitative information, but without (or possibly unreliable / unrepresentative) quantitative data (censuses, population monitoring)
U = Unknown - Unknown

As can be seen from the above table, in terms of abundance, 2 of the 20 species listed are classified as Uncommon (Steppe Cuckoo, Gyrfalcon), 4 as Frequent (Black-backed Nightjar, European Woodcock, European Curlew, Common Choughbird), 5 as Common (Balkan Woodpecker), European Blackcap, Eagle-eye, Middle Woodpecker, Buff-breasted Woodpecker) and 1 as Present (Crane Eagle), while for the remaining 7 species (Black Vulture, Golden Eagle, Eastern King Eagle, Snake Eagle, Crabeater, Vulture and Egyptian Vulture) a population count is reported. According to these, the Vulture was recorded with 0 pairs in 2000-2004, the Golden Eagle with 1-2 pairs in the same period, the Eastern Kingfisher with 2 individuals in 2004, the Kite and Egyptian Vulture with 2-3 pairs in 2000-2004, the Black Vulture with 8 individuals in 2007 and the Snake Eagle with 10 pairs in 1995. Of the species in the table, 3 species use the area as transient visitors, 11 species as breeding visitors, 4 species as residents, 1 species as unknown and 1 species as non-breeding. Data accuracy is good for 2 of the 20 species, moderate for 12 species and incomplete for 6 species.

Table 4.1-2 Conservation status of the species listed in the description form of SPA GR008 "Filiouris Valley and Eastern Rhodopes" and their presence in the wider Greek territory

Family	Kind of (Latin Name)	Species (Greek Name)	Status of Presence	IUCN	Hellenic Red Book	European Status Threats	Annexes to the Directive 2009/147/EC	Bern Convention	Bonn Convention
Accipitridae	***Aegypius monachus***	Black vulture	r	NT	EN	LC	I	II	II
Accipitridae	***Aquila chrysaetos***	Golden Eagle	r		EN	LC	I	II	II
Accipitridae	***aquila heliaca***	(Eastern) Vassal Eagle	r, wv	VU	CR	LC	I	II	I; II
Ciconiidae	***Ciconia nigra***	Black Stork	sv, pm		EN	LC	I	II	II
Accipitridae	***Circaetus gallicus***	Snake Eagle	cv, pm		NT	LC	I	II	II
Accipitridae	***Circus macrourus***	Stepocirko	pm	NT	DD	NT	I	II	II
Accipitridae	***clanga pomarina***	Screamer	sv, pm		EN	LC	I	II	II
Coraciidae	***Coracia garrulus***	(European) Copper pigeon	sv, pm	NT	VU	LC	I	II	II
Picidae	***Dendrocopos syriacus***	Balkan Woodpecker	R			LC	I	II	
Falconidae	***Brown Falco***	(European) Curcinezis	sv, pm	VU	VU	LC	I	II	I; II
Falconidae	***Falco vespertinus***	(European) Mavrokirkinze	PM	NT	DD	NT	I	II	II
Muscicapidae	***Ficedula semitorquata***	Oak woodpecker	sv, pm	NT	DD	LC	I	II	II
Accipitridae	***Gyps fulvus***	Vulture	R		VU/CR	LC	I	II	II
Accipitridae	***Hieraaetus pennatus (Aquila pennata)***	Falcon Eagle	sv, pm		EN	LC	I	II	II
Laniidae	***Lanius collurio***	Eagle Eagle	SV, pm			LC	I	II	
Picidae	***Leiopicus medius***	Middle Woodpecker	R			LC	I	II	
Accipitridae	***Neophron percnopterus***	Egyptian vulture	sv, pm	EN	CR	EN	I	II	II
Phylloscopidae	***Phylloscopus bonelli***	Bunophylloscope	sv, pm			LC		II	II
Strigidae	***Strix aluco***	(Common) Humphurist	R			LC		II	
Sylviidae	***Sylvia (hortensis) crassirostris***	Gingerbread Bear	sv			LC		II	II

MEMORANDUM TABLE

Status of Presence

R: Resident (epidemic)
SV: Summer visitor - Reproduced
PM: Passing visitor
PLM: Partially migratory species **NBV:**
Non-breeding visitor **WV:** Winter visitor
Acc: Random or rare visitor
Ext: Eclipse
FBr: Imported
(**NB:** for all the above: capital letters indicate that the species is common, small letters indicate that it is rare)
IUCN: Threat categories according to the IUCN/IUCN Red List of Threatened Species
CR=Critically Resistant
EN=Vulnerable
VU=Vulnerable
NT=Larely Threatened LC=Low
Concern DD=Depressedly
Deteriorated NE=Not assessed
Hellenic Red Book of the endangered vertebrates of Greece (Hellenic Zoological Society, A. Legakis, P. Marangou, 2009).
EX=Ecliponda
EW=Extracted from their natural environment
CR= Critically Endangered
EN=Vulnerable
VU=Vulnerable
NT=Larely threatened LC=Low
concern DD=Dependently
known NE=Not assessed.
SPEC: Species of European Conservation Concern (**SPEC:** Species of European Conservation Concern), the conservation category in which species are classified according to the publication "Birds in the European Union: a status assessment" by BirdLife International (BirdLife International, 2004).
1 = Species whose populations are considered to be of Global Conservation Interest, i.e. Globally Threatened, Near Threatened, or Not Well Known according to the IUCN Red List of Threatened Species
2 = Species whose populations are in an undesirable conservation status at European level and are concentrated in Europe
3 = Species whose populations are in an undesirable conservation status at European level although not concentrated in Europe
-E = Species whose populations are in a desirable conservation status in but are concentrated in Europe
- = Species whose populations are in a favourable conservation status and are not concentrated in Europe When SPEC is followed by the symbol (^{W}) it refers to wintering populations.
Threat status in the EU according to a publication of BirdLife International (2004).
CR= Critically Endangered
EN= Endangered
VU= Vulnerable
NT= Near Threatened
D= Reduced
R= Rare
H= Exhausted
L= Local
DD= Not sufficiently known
S= Fixed
NE= Not assessed (found in the area only during migration)
( ) = Provisional status.
Directive 2009/147/EC: on the conservation of wild birds:
I: Species subject to specific management measures relating to their habitat
II/1: Species authorised to be hunted in the geographical area to which the Directive applies
II/2: Species which may be hunted only in the Member State indicated
III/1: Member States shall not prohibit the exploitation of these species
III/2: Member States may prohibit the exploitation of these species
Bern Convention: The species included in the Appendices of the International Convention on the Conservation of European Wildlife and Natural Environment, as ratified by Law 1335/83.
Annex II: Species of fauna under strict protection
Annex III: Species of fauna under protection
Bonn Convention: Symbolizing the species included in Appendices I and II of the International Convention on the Conservation of Migratory Species of Wild Animals

Annex I: Endangered migratory species (Article 3(1))
Annex II: Endemic species whose conservation status is unfavourable and for which International Agreements are needed for their conservation and management, and those whose conservation status would benefit significantly from the international cooperation that would result from an International Agreement
b: Central European populations only
c: Only populations of NW Africa
d: Asian populations only
e: *Porzana parva* only
f: Only populations of Africa and South West Asia

Of the 20 different bird species listed in the above table, 17 belong to Annex I of Directive 2009/147/EC.
Of these 20 species, 3 species belong to the category of Agropasture Ecosystem species, 9 species to the category of Large Predators, 2 species to the category of Cranes, 4 species to the category of Intraforestry, 1 to Nocturnal and 1 to Herbivores-Pelecanomorphs (Dimalexis, 2009). The individual data on their populations have already been reported and the general categories they fall into and their correlation with the habitats found in the immediate area of the existing project are discussed below.

4.1.4 Inventory of the main characteristics of all species of avifauna listed in Annex I of Directive 2009/147/EC

In this chapter, the characteristics of the species of the SPA area under study that belong to Annex I of Directive 2009/147/EC are described. Of the 17 species included in Annex I of Directive 2009/147/EC, the characteristics of the species that are assessed in relation to the European Threatened Status and according to the Greek Red Data Book (6 species in total) as Critically Endangered (CR), Endangered (EN) and Vulnerable (VU) will be recorded. **The species included in Annex I are the following: *Aegypius monachus, Aquila chrysaetos, Aquila heliaca, Ciconia nigra, Circaetus gallicus, Circus macrourus, Clanga pomarina, Coracias garrulus, Dendrocopos syriacus, Falco naumanni, Falco vespertinus, Ficedula semitorquata, Gyps fulvus, Hieraaetus pennatus (Aquila pennata), Lanius collurio, Leiopicus medius, Neophron percnopterus.*** According to the Greek Red Data Book, **2** species (Aquila ***heliaca, Neophron percnopterus***) are Critically Endangered **CR**, **5** species (***Aegypius monachus, Aquila chrysaetos, Ciconia nigra, Clanga pomarina, Hieraaetus pennatus***) are Endangered **EN** and **3** species (***Coracias garrulus, Falco naumanni, Gyps fulvus***) are **Vulnerable VU.** At international level, *Neophron percnopterus* is Vulnerable and *Aquila heliaca* and *Falco naumanni* are Vulnerable.

These species are described in detail in terms of their characteristics, ecological requirements, threats and pressures.

Characteristic species of the study area

Large predators *(Aegypius monachus, Aquila chrysaetos, Aquila heliaca, Circaetus gallicus, Circus macrourus, Clanga pomarina, Gyps fulvus, Hieraaetus pennatus (Aquila pennata), Neophron percnopterus)*

In this category, the most used habitats include both open and forested areas. Thus, deciduous and coniferous forests are both nesting and foraging habitats for many species. Rocky slopes in the inland and coastal environment play an important role in the ecology of these species, as they are important nesting habitats. Open areas, such as areas with long vegetation and cultivated land, are

primarily the main feeding habitats of large predators. Also, some species such as Cirques (*Circus sp.*) feed in wetlands. The diet of large predators includes mainly mammals and birds, while some species are scavengers. Several species in this class are migratory.

Large predators are particularly vulnerable species and face many serious threats. It is characteristic that of the total of 6 species of this category, 5 are classified as endangered in the Red List of Threatened Birds, compiled by the Hellenic Ornithological Society. The main threats to birds of prey are related to the degradation of their habitats (abandonment of traditional agriculture, inappropriate forest management, pollution, housing development) and consequently the inability to find food. They also face major problems from the use of poisoned baits to combat 'noxious' mammals (wolf, fox, skunk, etc.) and from poaching. It should also be noted that these are species particularly sensitive to anthropogenic disturbance.

***Aegypius monachus* - Black vulture: EN (GR), LC (International)**

Ecological requirements - Distribution: The Black Vulture is widespread, mainly in the region of Thrace and marginally in eastern Macedonia. The only colony of the species is located in the National Park of Dadia-Soufli in the prefecture of Evros (Xirouchakis & Tsiakiris 2009).

The species always nests in trees in sparse stands of conifers (pines) and deciduous trees (oaks) in semi-mountainous and, hilly areas of low altitude (300-400m). In Greece, the only colonies of the species are found in black pine and larch forests (Poirazidis et al. 2004).

Black vultures forage in small groups or in pairs. It feeds on carcasses of medium-sized ungulates and small animals such as rabbits, which it locates by flying low (<100m) above the ground (Donazar 1993). Its foraging habitat is semi-mountainous forests with gentle slopes and several gaps with low vegetation (Adamakopoulos et al. 1994).

Threats: The destruction of semi-mountainous forests and the lack of stands of old trees are a major threat to the species. Disturbance during the nesting season due to logging activities also plays an important role in the reproductive failure of the species (Adamakopoulos et al. 1995). Afforestation, deforestation of sparse stands, undergrazing and abandonment of extensive livestock farming are the most important threats to its foraging habitat. The use of poisoned baits to control the wolf in mainland Greece played a decisive role in its extinction (Handrinos 1985). Also, the use of poisons to control the fox population in the Evros region resulted in the stagnation of the breeding population in the last decade (Antoniou et al. 1005, Skartsi et al. 2008). In the same region even the siting and operation of wind farms is a threat that needs to be monitored (Ruiz et al. 2005). Poaching, although potential, is considered a minor threat to the species.

***Aquila chrysaetos* - Golden eagle: EN (GR), LC (Internationally)**

Ecological requirements - Distribution: Has an average wingspan of over 2 metres and up to 1 metre in body length. The size of adult golden eagles varies, but some of them are the largest eagles in the genus *Aquila.* The golden eagle was the model for the aquila, the emblem of the Roman legions. Today it is included on the national coats of arms of Austria, Egypt, Mexico, Romania and other countries. The population of the golden eagle in our country has been estimated at 100-150 pairs (BirdLife International 2004). The Golden Eagle is mainly distributed in Thrace and Macedonia (except in the central part), the Pindus Mountains and Thessaly. In Sterea, it occurs mainly in the mountain complex Vardousia - Giona - Parnassos, while isolated territories have been recorded in Evia and the Peloponnese. On the islands it is endemic in Crete and possibly in the Cyclades (Syros). In Crete, the subspecies *Aquila chrysaetos homeyeri* is considered to be the subspecies *Aquila chrysaetos homeyeri but* this has not been proven by genetic analysis.

The Golden Eagle nests on rocks (800 - 2000 m) although nesting has also been recorded in trees in areas where food is abundant.

The species is restricted to mountainous areas with rocky outcrops for foraging. It prefers open areas with low vegetation and avoids forests, although it may be endemic to woodland areas using gaps to forage. It occurs mainly in mountainous and semi-mountainous areas and is often seen in the alpine zone in summer. Its diet consists mainly of small and medium-sized birds and mammals (e.g. partridges, hares, rabbits, pigeons, marmosets, rabbits, but also skunks, squirrels and foxes) and dead animals, especially in winter. In mainland Greece, reptiles are a major food source, with turtles being the main representative, while in Crete newborn lambs form part of the diet.

Threats: Disturbance to nesting sites, mining activities and changes in traditional land use, combined with the use of poisons and direct persecution are the most serious threats to the species.

***Aquila heliaca* - Eastern kingfisher: CR (GR), VU (International)**

Ecological requirements - Distribution: In the pre-war years and until the 1960s it was common in Greece and widely distributed but the population of the kingfisher suffered a dramatic decline and today it is probably no longer reproduced in Greece: The last known pairs survived in the southern part of southern Evros until the mid-1980s, although perhaps 1 pair still (Handrinos & Akriotis 1997, BirdLife International 2004). Today the king eagle is a rare and local winter visitor, with an average of 6-10 individuals per year, mainly in the large wetlands of northern Greece (Evros Delta, Kerkini River, Kalamas Delta, Evros Delta, Kerkini River, Kalamata River, Kerkini River, Kalamata River, and the

etc.). A few individuals, mainly juveniles, migrate south in autumn along the Ionian coast (Messolonghi, Western Peloponnese etc.) (Chandrinos 1992, Handrinos & Akriotis 1997, EOE data). There are 10 recoveries in Greece of ringed individuals in Hungary (5), Slovakia (4) and Bulgaria (Akriotis & Chandrinos 2004). The only species of the genus Aquila living in lowland/semiplain areas.

It nests in trees in lowland and riparian forests and forages in open steppe areas and crops, while in winter it frequents large wetlands.
During the breeding season it feeds on small to medium sized mammals, reptiles and birds, while in winter it feeds mainly on waterfowl, often also on carrion (Adamakopoulos et al. 1995, ANEE & OIKOS EPE unpublished data). Rabbit eels were once its main prey.

Threats: The main threats to the species are degradation of lowland and riparian forests and (to a lesser extent) wetlands, declining prey, poaching and poisoned baits. Although it used to breed close to settlements, it is a very sensitive species during the breeding season.

***Circaetus gallicus* - Snake eagle**

Ecological requirements - Distribution:
O Snake Eagle spreads mainly in mainland Greece and some islands, although it does not reproduce in all of them. Its distribution reaches as far as the southern Peloponnese while the bulk of its population is in the central Peloponnese. and northern Greece (Handrinos & Akriotis). The species nests in large trees in mature deciduous and coniferous forests.
species (*Pinus spp*. *Quercus spp*. *Fagus spp.*) in semi-mountainous and mountainous areas (Cramp & Simmons 1980, Tucker & Heath 1994, Bakaloudis et al. 2001, Bakaloudis et al. 2005, Gensbol & It feeds almost exclusively (87%) on reptiles (snakes, lizards) and to a much lesser extent on birds and small mammals. Its foraging habitat includes open, dry areas with low vegetation, pastures and rock formations, but also crops alternating with bare fields and dry grasslands where reptiles abound (Bakaloudis et al 1998).
Threats: The destruction of mature forests, fires and disturbance due to forest roads, logging or recreational activities are the main threats to its reproduction. Deforestation of open areas, undergrazing, abandonment of traditional grazing systems and mountain crops, and intensification of agriculture are key threats to the Snake Eagle's hunting habitat. Also the use of herbicides and pesticides are reducing the availability of its food. Poaching is an additional threat especially during the migration of the species.

***Circus macrourus* - Steptococcus**

Ecological requirements - Distribution:

The species The species is observed Observed at throughout It is found throughout mainland Greece and the islands (Handrinos & Akriotis 1997). The habitat of Stepokirkos includes open lowland areas with low vegetation and is not so dependent on t h e presence of water.

It feeds on small birds, micro-mammals, reptiles and insects (Cramp & Simmons 1980, Ferguson-Lee & Christie 2001, Leckie et al. 2008, Arroyo et al. 2009).

Threats: The destruction and shrinkage of wetlands and especially the drying of marshes. Also deforestation and undergrazing of open areas e.g. subalpine grasslands degrade the foraging habitat of the species (Tucker & Heath 1994, Gensbol & Thiede 2008, Cormier, et al. 2008).

***Clanga pomarina* - Kraygaetos: EN (GR), LC (International)**

Ecological requirements - Distribution:

General The screamer is a medium-sized European eagle and, in essence, onlyo crossbill is smaller than it. In general is similar in appearance to its close relative the Spotted Eagle, with to which indeed, it shares part of its territory and it is difficult in field observation for an untrained eye to distinguish them, especially when flying. This, creates problems in gathering the data that is so essential for recording its population.

The crane is a fully migratory species, occurring exclusively in the Old World (Palaearctic, Indo-Malayan and Afrotropical ecozones), especially in the K. and E. Palaearctic. Its summer breeding range has its western boundaries in a line from northern Greece, Slovenia, Hungary, Hungary, Slovakia and Poland, extending eastwards to the Black Sea, Asia Minor, the Caucasus countries and the western Caspian coast, and northwards to the Baltic countries and European Russia. There, the zone is interrupted to continue to India and the countries near the Himalayas, where the kingfisher is a permanent resident (epidemic.) The kingfisher stays in its breeding area for about 5 months (mid-April to mid-September). They are highly dependent on gyre flight, hence on upward thermal currents, avoiding large water masses. The species migrates through Turkey, Syria, Lebanon, Lebanon, Israel, Egypt, Sudan, Sudan, Uganda and Tanzania, to spend the winter in central and

southern Africa: in South Zaire, northern Namibia, Zambia, Zimbabwe, Mozambique and Angola southwards to Botswana and northern South Africa (Meyburg et al. 1995). In Turkey and Israel, the cranesbill is a migratory, transhumant species.

The screamer is considered an eagle with a fairly specialised ecosystem. It occurs in lowland and semi-field forests, but always in the vicinity of freshwater wetlands, where it forages (Chandrinos 2009). Greece, it is observed almost exclusively in dry pine forests, at altitudes between 100 and 300 m, while deciduous forests are usually avoided (Vlachos 1989). However, when hunting, it frequents large clearings, forest meadows, fields with scattered trees, or open valleys with small marshes, streams and bushes.

Threats: The main causes are environmental: deforestation of lowland forests, clearing of plantations, drying of grasslands and intensive logging. Despite poaching, which is always a problem, it does not appear to be the main cause of the population decline, but it may be pesticides, particularly in the feeding areas (marshes, wet meadows), which must be preserved. Locally, it is threatened by human encroachment on nesting habitats, mainly by quarrying and road building. In the IUCN database the conservation status is described as 'Minimally Important', as the species' populations are considered to have stabilised.

***Gyps fulvus* - Vulture: VU (GR), LC (International)** Ecological requirements - Distribution: Vulture is an epidemic species in Greece and the wider region. In Greece, the population of the Vulture in the 1980s was estimated at 450 pairs with 250 of them in Crete alone. More recent estimates put the population of the species at no more than 300 pairs. The Vulture is listed in List I of the EU Directive 2009/147/EC and is under strict protection and is classified as rare and vulnerable to extinction.

Red Book of Threatened Vertebrates. The predator *Gyps fulvus* maintains colonies in Thrace, Epirus and Aitoloakarnania, on some islands of the Cyclades and in Crete. Many juveniles from the Balkan countries are observed in autumn during the dispersal phase or in winter in western Greece and Thrace (Skartsi et al. 2008, Xirouchakis & Tsiakiris 2009).

The vulture nests in groups of 2-18 pairs always in rocky crags, mainly of limestone substrate, while on the islands several colonies are found on coastal rocks. A species of open areas, the Vulture is found in semi-mountainous and mountainous areas with good wild ungulate populations or intensive livestock farming.

It feeds exclusively on dead animals of large or medium size, choosing the soft parts of the body. Almost throughout its range in the Western Palearctic, the species follows nomadic herds on their seasonal movements. As a result, in winter it is found in semi-mountainous areas near crops, topsoil or bare ground or any type of habitat as long as it is used as pasture, while in summer

in scrubland, mountain crops and mainly mountain and sub-alpine meadows with livestock activity. Also the existence of rocks and hilly areas with low vegetation facilitates the flight of the species using orographic and thermal currents. The breeding season lasts from mid-January to mid-March, with the majority of nesting occurring in late February. It lays one egg, which incubates for 57 days, with the chick hatching in 120-140 days.

Threats: The abandonment of mountain grazing systems and the decline of nomadic livestock farming combined with the use of poisoned baits to control the wolf population have played a decisive role in the decline of the species in mainland Greece.

***Hieraaetus pennatus (Aquila pennata)* - Hawk Eagle: EN (GR), LC (International)**

Ecological requirements - Distribution: In Greece o in Greece Greece is a summer resident visitor and transient migrant, with a fairly wide distribution. It nests mainly in northern (Thrace, Macedonia, Epirus) and central Greece, where it is rather rare (Handrinos & Akriotis 1997). Typically Forest-dwelling predator. It nests in forests of medium and high forest cover. low altitude (conifers, deciduous or mixed), alternating with bushes, meadows, glades and open areas where it finds its prey. It feeds on a variety of small and medium-sized birds, reptiles and mammals (Adamakopoulos *et al.* 1994). A species with a variation in the colour of the adult wing (whitish or brownish phase), it is estimated that about 60% of the Greek population belongs to the whitish phase (Handrinos & Akriotis 1997). It is generally a species that has not been sufficiently studied in our country.

Threats: It is mainly threatened by interventions and degradation of lowland and semi-mountainous forests (poor implementation of forestry practices, road building, etc.) where it nests, reduction of its prey due to the ongoing intensification of agriculture (clearance, destruction of plant barriers, pesticides, etc.) and perhaps poaching during migration.

***Neophron percnopterus* - Egyptian vulture: CR (GR), EN (International)**

Ecological requirements - Distribution: The Egyptian vulture is a vulture and is an endangered species. It can fly around for hours within a radius of about 20 km (up to a maximum of 70 km!) from its nest to feed. It is a migratory species that comes to Greece in spring from Africa. It is found mainly in the Meteora region but also in the areas of Konitsa, Pinovo and the protected forest of Dadia. It mainly prefers plains, wetlands, highlands and mountains. It is widespread in southern Europe, Africa, India and the Middle East.

T and fly in circles, starting low and reaching very high a young so that they can learn to fly well in order to be ready for their first big flight in the migration season.

Like all vultures, the Egyptian vulture feeds exclusively on dead animals. Each species of vulture feeds on different parts of the animal's body. The Egyptian vulture must wait for the other vultures to finish before it can approach. Because of its thin beak, this species feeds on the remains left by other vultures that cannot reach it. Its menu also includes insects, reptiles, small mammals, rotten fruits and vegetables.

The Egyptian vulture makes its nests on steep rocks where it usually lays 2 eggs in April which are laid by both parents for 42 days. The young are dark brown in their first year of life which becomes lighter in their second year until they reach their final colour as adults. Individuals of the species reach adulthood after 4-5 years.

Threats: The main reason for the rapid decline of the Egyptian vulture population is the radical change in our way of life, especially in rural areas of Europe with the intensification of agriculture and livestock farming, the disappearance of grassland in the lowlands and the reduction of extensive livestock farming. Mechanisation has meant a dramatic reduction in the population of livestock and the need to deal with disease has led to the compulsory burial of dead animals, the compulsory burning of all animal waste from slaughterhouses and the closure of landfills. In Africa, the overgrazing of acacia forests and the dramatic decline of wild ungulates such as gazelles and large birds such as ostriches due to hunting have had a negative impact. With a global population of less than 30-45 thousand adults and a decline of up to 86% in sub-Saharan Africa in 30 years, it seems that the Egyptian vulture is heading towards total extinction.

The increase in direct mortality is mainly due to direct poisoning from chemicals such as "carnivore killers", antibiotics administered in bulk to stabled animals leading to the collapse of the birds' immune systems, pesticides sprayed on garbage dumps abroad, agrochemicals and lead poisoning. Also

cases of collision with wind turbines, high-voltage cables and power transmission pylons are mentioned. The explosive mix is supplemented by the disturbance caused by the construction of large engineering works near nesting sites.

France is the only country in the world where, after many years of efforts, the species is increasing. Another ambitious captive breeding and reintroduction project has been successfully launched in Italy. In Greece, the Greek Ornithological Society is implementing a conservation programme for the Egyptian Vulture, LIFE+ for the protection of the Egyptian Vulture, entitled: "Urgent measures to ensure the survival of the Egyptian Vulture *Neophron percnopterus* in Bulgaria and Greece" (LIFE10 NAT/BG/000152)".

Falcons *(Falco naumanni, Falco vespertinus)*

Falcons use open areas such as grasslands, scrub and cultivated land for feeding. Rocky slopes are their main foraging habitat, with some species preferring coastal rock formations (*partly Falco peregrinus*). A special case is the kestrel (*Falco naumanni*), which nests in colonies almost exclusively in old buildings. Falcons feed mainly on small birds and mammals, as well as on insects.

The intensification of agriculture, residential development, the abandonment of traditional land uses degrade the breeding and feeding habitats of falcons. Also, pesticides, persecution and disturbance are major threats to this category of species.

***Falco naumanni* - European Curcinezis: VU (GR), VU (International)**

Ecological requirements - Distribution: The main breeding areas of the species in Greece are estimated from Thessaly to Southwestern Macedonia, but there are some other areas in the rest of mainland Greece, where the species occurs sporadically. According to the Red Data Book of Threatened Vertebrates of Greece (2009), the species

It is considered Vulnerable (VU). 140 colonies have been recorded throughout Greece and its total population is estimated at 2,600 to 3,300 pairs, with a decreasing trend (Boussouros D., 2009). Hallmann B. (1995) and Bousbouras D. (Bousbouras 2006), report that Thessaly maintains the most important and largest part (reaching 75%) of the breeding population in Greece. The remaining 25% that breed outside of Thessaly is found in the prefectures of Aitoloakarnania, Ilia, Fthiotida, Pella, Kilkis, Kozani, Florina, Serres and Rodopi. Also in the cities of Ioannina, Galaxidi and Tripoli as well as on the islands of Lemnos and Lesvos.

The Circinus is a migratory species and arrives in the areas where it will nest in early spring. It chooses to nest near other pairs of its species, thus forming colonies that usually consist of 15-25 pairs. After the pair has formed, the birds remain near or in the nest, which they protect. For its nest, the Circinus chooses holes in tall buildings, in the walls of houses and warehouses or on roofs. It feeds mainly on insects, the majority of which are large insects.

orthopterans, such as crickets and crickets (Gryllidae), grasshoppers (Acrididae) and onion-eaters (Gryllotalpidae), as well as coleopterans - mainly scarabs (Scarabaeidae) and beetles (Carabidae). A family of crickets can consume up to 160 grasshoppers per day during the period when they are rearing their young. In addition to insects, it also preys on small mammals and lizards. It flies in small groups in places in the countryside with good visibility - without many trees.

The curcinesi lives in warm, open areas, e.g. in steppe and pseudosteppe areas, grasslands, non-irrigated crops and occasionally in topsoil and open woodland. Its presence is directly dependent on the presence of large insect populations, which are its prey.

Threats: Apart from possible habitat loss in wintering grounds in Africa and during migration, the species faces serious problems in Greece. The main ones are: lack of nesting sites (old houses, warehouses, roofs in new houses with small openings in the tiles with little space capable of incubating eggs and raising chicks; poisoning by pesticides or insecticides may be a serious threat but there is insufficient evidence to document it as a threat; direct killing that used to occur in the past, mainly during spring hunting or by aerial guns, disturbance or destruction of eggs and chicks and destruction of roosting sites (before and after breeding), restriction of feeding sites (pseudo-stable environments, open uncultivated grassland, uncultivated areas between crops, cereals, other non-irrigated crops). Conversion of grasslands and non-irrigated crops to irrigated (cotton, corn, beets) or orchards, resulting in the reduction of Orthoptera and other insects and invertebrates, which are the main food source of the species, and afforestation or densification of shrubs, drastically reduce food availability.

***Falco vespertinus* - Black Curassow**

Ecological requirements - Distribution: The Mavrokirkinzo is found throughout mainland and island Greece during migration. Large concentrations of the species are observed mainly in the plains of northern Greece (Macedonia, Thrace) during the autumn migration (Handrinos & Akriotis 1997, BirdLife 2004).

Nests in colonies in holes in tall buildings, under roofs and in cavities

rocks.

The Blackcurlew prefers open areas with crops, grasslands but also Mediterranean toads and macaws where it feeds mainly on insects and captures reptiles and rarely small birds (Cramp & Simmons 1980, Holzinger 1987, Gensbol & Thiede 2008).

Threats: Agricultural intensification and the extensive use of pesticides and insecticides are the main threats to the species (Tucker & Heath 1994). In addition, poaching is a threat to the Blackcap for several Mediterranean countries (Newton 1979).

Interwoods (*Dendrocopos syriacus, Ficedula semitorquata, Leiopicus medius, Phylloscopus bonelli*)

This category includes species whose main breeding and feeding habitats are broad-leaved deciduous or evergreen, coniferous and mixed forests. These species also use tree plantations or urban parks as habitats. They nest in trees and feed on insects, fruits and seeds. With the exception of *Ficedula sp.* and *Phylloscopus bonelli*, the other species in this category are epidemic.

As expected, human activities related to the degradation of forest ecosystems are the most important threats to endemic forest species. Thus, deforestation and inappropriate forest management are the main causes of degradation of the breeding and feeding habitats of inland forest species.

Given the location of the proposed project and the ecosystems (Sparsely vegetated areas, Hardwoods, Natural Pastures and Mixed Forests) found there, the presence of all of the above species is expected.

***Dendrocopos syriacus* - Balkan Woodpecker**

Ecological requirements - Distribution: The Balkan Woodpecker is found at higher altitudes in northern and central (eastern Thessaly) Greece. Quite common near villages and gardens or parks (Handrinos & Akriotis, 1997).

The species nests in a wide variety of tree species, in cavities opened by both sexes (Cramp, 1998). Selection of suitable nest sites is related to the availability of mature trees near areas rich in food resources (Tucker, & Heath, 1994). It selects sites with a strong habitat mosaic, where islands of woodland (mainly deciduous) alternate with hedgerows, scattered old trees, or stream vegetation in agricultural or agroforestry areas (Tucker & Heath, 1994; Handrinos & Akriotis, 1997). Also preferred are woodlands with natural openings and gaps or forest habitats with grassland.

Food ecology: The Balkan woodpecker feeds mainly on insects, foraging in the crown and branches of trees but sometimes also on the ground. Also, fruits and nuts form an important part of its diet (Cramp, 1998). The species' feeding areas should provide a variety of food for both insects and fruits, and for this reason the species chooses complex cropping systems (e.g. perennial tree crops) adjacent to mainly deciduous forests. Plantations with conifers are usually avoided (Cramp, 1998).

Threats: The main threats to the species are related to the degradation/loss of critical breeding: habitat. Thus, the intensification of forestry by logging mature forest stands is degrading its nesting habitat, reducing the suitable trees available (Tucker & Heath, 1994). Also, the gradual decline of traditional livestock production in agroforestry areas is leading to deforestation

meadows and meadows, which are important feeding grounds for the species. At the same time, the abandonment and replacement of tree stands (e.g. almond, walnut, mulberry) with other types of crops, the reforestation of conifers in deciduous forests, the destruction of stream vegetation in agricultural landscapes e.g. willows, leys and reforestation projects, greatly reduce the heterogeneity of the topography required for the establishment of the dominant species (Tucker & Heath, 1994).

***Ficedula semitorquata* - Oak flycatcher**

Ecological requirements - Distribution: Both the distribution and population status of the species are poorly known The species is mainly observed in northern Greece from Epirus, Thessaly and further north. (Handrinos & Akriotis, 1997).

The woodpecker nests in natural cavities or cavities opened by woodpeckers, mainly in dead logs or dead branches, mainly deciduous trees. The height of the nest ranges from 2.5 to 12 m from the ground (Cramp, 1998). The selection of suitable nest sites is closely related to the presence of oakleaf trees in the area which open suitable cavities for nesting, which are colonized by the Oak-backed Woodpecker. The species selects mature, closed forests of deciduous mainly beech, with high and bare trunks, in the absence of understorey (Handrinos & Akriotis, 1997). Also, in lowland areas, it is observed along streams, in the presence of surface water, dominated by stands of Platanus orientalis or Alnus glutinosa (Tucker & Heath, 1994). In some cases it is possible to nest near or within settlements e.g. in central squares with mature sycamore trees and in the presence of water (Tucker & Heath, 1994). In suitable habitats population density is high as neighbouring pairs may nest on average within 70 m of each other (Cramp, 1998).

The species feeds on insects which it catches in flight (Cramp, 1998). During the breeding season the species feeds in close proximity to the nest. This leads to the selection of sites with high abundance of insects. For this reason, in lowland areas it feeds in streams in the presence of water and mature forest as t h e availability of insects in these areas is particularly high (Tucker & Heath, 1994). At the spatial level of the landscape, mature forests with a high proportion of deciduous species especially beech are preferred. Competition:The oak leafhopper develops strong competition for nesting space with other species that colonise oak nest sites, such as puffins, Sitta europaea and treeflies (Cramp, 1998).

Threats: The main threats to the species are related to the degradation/loss of critical habitat. Thus, the intensification of forestry with the felling of mature forest stands and the extraction of dead standing trees threatens the species at the spatial level of the territory. The construction of forest roads along the streams also alters its habitat. At the spatial level of the landscape, a serious threat is the gradual reduction of the total biomass, particularly of mature forests, through logging operations. In addition, the clear-cutting of deciduous forests and the establishment of conifer plantations in them is leading to a loss of habitat.

***Leiopicus medius* - Middle Woodpecker**

Ecological Requirements - Allocation: Breeds mainly in deciduous forests with old trees, sometimes sparse and dry (e.g. tame oak forests in western Greece) or denser and wetter, but with openings. It prefers warm places. Also in valleys with clusters of willows and poplars and conifers (mainly South Greece, Peloponnese) and in olive groves (Lesvos). It feeds on insects and sap from tree trunks. It spends a lot of time high up in tree tops and often hops along horizontal, thick branches looking for insects. It digs its nest on a rotten log or thick branch, sometimes steeply sloping or nearly horizontal at an entrance diameter of 4 cm.

Threats: The main threats to the species are related to the degradation/loss of critical habitat. Thus, the intensification of forestry with the logging of mature forest stands and the extraction of dead standing trees threatens the species at the spatial level of the territory (Angelstam et al, 2004; Muller et al, 2009). At the spatial level of the landscape, forest fragmentation is a serious threat (Pasinelli, 2000). Also, deforestation of deciduous forests and. the establishment of conifer plantations in them leads to habitat loss (Kosinski, & Winiecki, 2004).

Species of Grassland Ecosystems *(Coracias garrulus, Lanius collurio, Sylvia (hortensis) crassirostris*)

This large category includes species that are endemic to open areas. Thus, it includes species characteristic of the Mediterranean landscape (macaws and toadflaxes) such as chironomids, chinchillas and cephalopods. Also included are agricultural species as well as alpine meadow species. The main habitats for the species in this category are cultivated land, grasslands (mesophilic, dry, alpine), areas with topsoil and long vegetation, scrubland, inland foothills, etc. Most species nest on the ground or in bushes, and this group also includes the swallow swallow, which nests in buildings. The food of these species includes insects, seeds and fruits.

Threats to these species are almost exclusively linked to the degradation and destruction of their breeding and feeding habitats. Thus, the most important threats are the abandonment of traditional livestock farming, which leads to the deforestation of open areas. In addition, the intensification of agriculture and the abandonment of traditional farming practices are degrading the habitat by destroying features of the rural landscape that are important for the ecology of the species, such as hedgerows, scattered trees, dry stone walls and riparian vegetation. Two other threats are linked to modern agricultural practices: afforestation, which completely alters the rural landscape, and agrochemical pollution. Other important threats are residential and tourist development, especially in coastal areas, hunting and poaching for species such as *Alectoris graeca, Coturnix coturnix, Crex crex* and fires.

***Lanius collurio* - Eagle-eye**

Ecological Requirements - Allocation: The species has a wide distribution in mainland Greece. It breeds on some islands (e.g. Lemnos, Lesvos). The Aetomachus nests on several islands (e.g. Lesvos, Greece, Lemesos). in bushes and trees, forming nest Type: "The nest is located at an average height of one metre above the ground. The breeding territories have an area of about 1.5 ha (Cramp & Perrins 1993, Muller et al. 2005, Tucker & Heath 1994). Reproductive success increases when the species nests relatively early in spring, when the nest has sufficient cover and when there are few predators (mainly crows). In contrast, reproductive success does not seem to be affected by parental age, nest height or weather conditions (Golawski 2008, Muller et al. 2005).
The species feeds on insects (mainly beetles), other invertebrates, small mammals, birds and reptiles in open grasslands with scattered shrubs, on slopes with maquis, in crops, on the borders and in forest clearings, in hedgerows, in vineyards (Cramp & Perrins 1993, Tucker & Heath 1994). It can often be found at relatively high altitudes, up to 1500 m (Handrinos & Akriotis 1997). Prey is located from exposed, relatively low overhead points Importantly, thorny bushes are present on which birds pin their prey. Grasslands with mild grazing have a positive effect on the foraging of eagle owls. Such areas provide on the one hand several sections with shrubs and scattered trees, i.e. supervisory sites, and on the other hand grazing does not allow excessive growth of shrubs, which negatively affects foraging success (Golawski & Meissner 2008, Muller et al. 2005, Vanhinsbergh & Evans 2002). Also, grasslands and pastures are preferred over cultivated areas due to more abundant food (Golawski & Golawska 2008). In southern Europe, preferred habitats include grassland/cropland mosaics with scattered shrubs and vegetation fences (Brambilla et al. 2007).
Threats: Intraspecific competition, as well as intraspecific predation on chicks, affects the population density of the species (Muller et al. 2005). Eagle-eye chicks are often preyed upon by coral reefs.

***Coracias garrulus* - Rattlesnake: VU (GR), NT (International)**

Ecological requirements - Distribution: The population of the copperhead in our country is estimated at 200-300 pairs. The breeding population is estimated at 200-300 birds.
The breeding population is estimated to be 200-300 birds, with a breeding population of 200,000. The breeding population in the study area (near Eleftheres) was estimated at 4 pairs (Bousbouras. Δ., 2005). It is a summer visitor to the study area. Chalcocouruna nests in cavities of trees ή at in some cases in rocks, houses and galleries

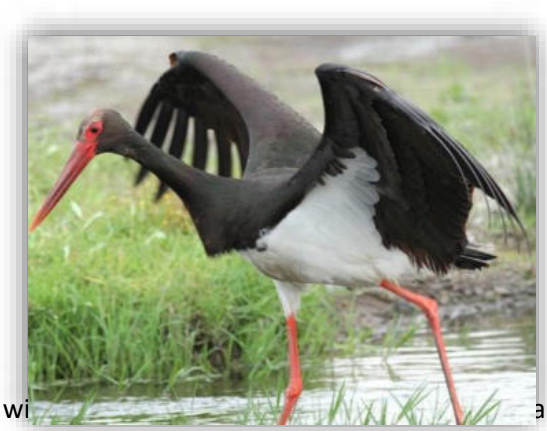
into the ground. It often uses cavities in trees that have been opened by other species, especially woodpeckers of the genus Pinus. Prefers grasslands or mildly intensive crops in the presence of scattered trees especially oaks. It also prefers areas adjacent to river or stream beds with rich riparian vegetation. The availability of nesting sites largely regulates the final selection of breeding habitat, so often the optimal sites are reused each year. Pair densities range from 1 to 4 pairs per km^2 at suitable sites. Feeds on medium to large sized insects mainly coleoptera and orthoptera. It uses dry branches at the tops of trees to supervise and locate its prey. Prefers sunny, warm locations in extensive crops, valleys, meadows, open areas with scattered trees especially oaks. In rural areas it chooses non-intensive crops where they usually receive the least amount of agrochemicals and are rich in food resources.

Threats: The main threat to the species is the intensification of agriculture through which extensive cultivations with scattered trees are transformed into open intensive cultivations reducing the availability of suitable sites for nesting. In addition, the extensive use of agrochemicals in crops reduces the food availability of the species and has a negative impact on its populations.

Herons - Pelican (*Ciconia nigra*)

This category includes herons, storks, pelicans, as well as the Fishcock (*Plegadis falcinellus*), the Chuliar Flycatcher (*Platalea leucorodia*), the Cormorant (*Phalacrocorax carbo*) and the Lesser Kestrel (*Phalacrocorax pygmeus*). A common characteristic of the majority of these species, apart from their direct association with the aquatic environment, is that they breed in colonies in trees close to their feeding areas. Therefore, in addition to wetland habitats (standing fresh and salt water, wet meadows, salt marshes, lagoons, reed beds), aluvial and hydrophytic forests are very important habitats for their reproduction. They feed mainly on fish (herons, pelicans, cormorants, cormorants, langoustines), but also on invertebrates, amphibians, reptiles, etc. (storks, herons, egrets, chuliar flycatchers, chalcocots). Finally, most species in this category are migratory.

Wetland drainage and other land reclamation projects degrade and destroy the breeding and feeding habitats of these species. In addition, some species, such as pelicans, are particularly sensitive to human disturbance during the breeding season and therefore anthropogenic disturbance is a significant threat to these species.



***Ciconia nigra* - Black-headed *Ciconia*: EN (GR), LC (International)**

Ecological requirements - Distribution: The Black-backed Stork nests in forests but feeds near water so it prefers forests near lakes, marshes and rivers, it is a rare bird that is endangered according to the "Red Book of Endangered Vertebrates of Greece". It belongs to the order Ciconiiformes (Ciconiiformes) and the family Ciconiidae (Ciconiidae). wi a. It arrives on breeding grounds in mid-March and leaves from the second half of August to mid-September. It is a large-sized bird as it reaches 96cm in height, 2m wingspan and 3kg in weight. It differs from the stork (*Ciconia ciconia*), which is also slightly larger, because of its colour, which is black with metallic green and purple highlights on the upper part and white on the lower part. The beak and legs are coral red. It always flies with the neck stretched out and the legs outstretched. The Black Stork (*Ciconia nigra*) is a solitary bird and does not nest in colonies or near humans as the Stork (*Ciconia ciconia)* does. In contrast, it prefers forests with large trees, mainly conifers, where it builds its nest and does not accept the presence of other individuals of its species in an area of about 100 square kilometres. It is monogamous and after mating lays 2-6 eggs, one every 2 days. It feeds on snakes, lizards, frogs, toads, rats, mice, moles, insects and the eggs and chicks of other birds.

In Greece it is found in Thrace, Macedonia, Epirus, Lesvos and northern Thessaly in forest areas. The most important ones are the forest of Dadia, the straits of Nestos where half of the approximately 50 nesting pairs in Greece nest, Mount Olympus, Halkidiki and Pindos. In the rest of the world, it nests in Spain, Portugal, France, Luxembourg, northern Italy, Germany, eastern Europe, Asian Russia, central Asia, North Korea and North Africa.

Threats: A critical factor is the degradation of the Black-backed Stork's nesting habitat due to deforestation, opening of forest roads in inaccessible forest areas and consequent disturbance and cutting of large mature or dead trees in which it nests. With regard to feeding and staging habitats, critical factors include drainage of seasonal freshwater ponds and marshes, use of agrochemicals, straightening, channelisation, pollution and general degradation of small streams in semi-mountainous areas. The Black-bellied Stork is probably the most directly threatened species of Greek avifauna by the construction of hydroelectric dams. In addition, the species has been recorded as a victim of poachers' shootings and impacts on power lines.

4.1.5 Inventory of fauna species listed in Annex II to Directive 92/43/EEC for Natura 2000 'BG0001032' Rodopi - Iztochni

Table 4.1-3 presents the presence status and population data of the fauna species of the Bulgarian EEZ that fall under Article 4 of Directive 2009/147/EC and are included in Annex II of Directive 92/43/EC, as well as their assessment, according to the updated data of the project "Monitoring and Assessment of the Conservation Status of Species and Habitat Types of Community Interest in Greece".

Table 4.1-3 Species referred to in Paragraph 3.2 of the TAP for Natura 2000 'BG0001032' and their evaluation (in green the handler species)

Kind of					Population in the area					Area assessment			
Omada	Cupid	Scientific name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C	
						Min	Max				Pop.	Con.	Big.	Glo.
F	1130	*Aspius aspius*			p	36351827	36351827	area	P	P	C	B	A	A
I	1093	*Austropotamobius torrentium*			p			i	R	M	C	A	B	A
M	1308	*Barbastella barbastellus*			p	725	1146	i	V	M	B	B	C	B
F	5088	*Barbus cyclolepis*			p				C	DD	B	A	C	A
A	1193	*Bombina variegata*			p	129	129	localities	C	G	B	A	C	A
M	1352	*canis lupus*			p	25	30	i		G	B	A	C	A
I	1088	*Cerambyx cerdo*			p	719443	1061539	i	R	M	B	B	C	A

Kind of					Population in the area						Area assessment			
Omada	Cupid	Scientific name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Big.	Glo.
F	1149	*cobitis taenia*			p	3255320	3255320	i	C	G	B	B	C	A
I	4045	*Coenagrion ornatum*			p	1	1	localities	R	G	C	A	C	A
I	4032	*Dioseghyana schmidtii*			p	139300	204282	i	C	M	B	A	B	A
R	5194	*Elaphe sauromates*			p	1	1	localities	V	P	B	A	B	A
R	1220	*Emys orbicularis*			p	22	22	localities	C	G	B	A	C	A
I	1074	*Eriogaster catax*			p	80	865	i	V	P	A	A	C	B
I	1065	*Euphydryas aurinia*			p	26551	52864	i	C	P	B	A	A	A
I	6199	*Euplagia quadripunctaria*			p	326977	625794	i	C	P	B	A	C	A
P	2327	*Himantoglossum caprinum*			p				R		C	B	C	B

Kind of					Population in the area					Area assessment			
Omada	Cupid	Scientific name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C	
						Min	Max				Pop.	Con.	Big.	Glo.
I	1083	*Lucanus cervus*			p	733930	1443777	i	R	M	B	B	C	A
M	1355	*Lutra lutra*			p	43	86	i		G	B	A	C	A
I	1060	*Lycaena dispar*			p				V	DD	C	A	B	A
R	1222	*caspica*			p	16	16	localities	C	G	A	A	B	A
M	1310	*Miniopterus writer's service*			r	2000	3500	i	C	G	B	B	C	B
M	1310	*Miniopterus writer's service*			w	250	500	i	R	G	C	B	C	C
I	1089	*Morimus funereus*			p	1023658	1189018	i	R	M	B	B	C	B
M	2617	*Myomimus roachi*			p	0	2	localities	V	P	B	B	B	B
M	1323	*Myotis bechsteinii*			p	973	1947	i	R	M	B	B	C	B
M	1307	*Myotis blythii*			p	3000	4500	i	C	G	A	A	C	A

Kind of						Population in the area					Area assessment			
Omada	Cupid	Scientific name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Big.	Glo.
M	1316	*myotis capaccinii*			w	11	50	i	V	G	C	B	C	C
M	1316	*myotis capaccinii*			r	2000	3500	i	R	G	A	B	C	A
M	1321	*Myotis emarginate us*			r	6000	10000	i	R	G	A	B	C	A
M	1324	*Myotis myotis*			r	3500	5000	i	C	G	A	B	C	A
M	1324	*Myotis myotis*			w	51	100	i	C	G	C	B	C	C
I	1084	*Osmoderma eremita*			p	102651	201042	i	R	M	B	B	C	B
I	4053	*Paracaloptenus caloptenoides*			p	15	15	localities	C	M	B	A	C	A
I	4022	*Probaticus subrugosus*			p				V	DD	B	B	C	A
M	1306	*Rhinolophus blasii*			w	1000	1500	i	R	G	A	B	C	A
M	1306	*Rhinolophus blasii*			r	800	1200	i	R	G	A	B	C	A
M	1305	*rhinolophus us euryale*			w	101	250	i	V	G	C	B	C	C
M	1305	*rhinolophus us euryale*			r	500	1000	i	C	G	B	B	C	B

Kind of						Population in the area					Area assessment			
Omada	Cupid	Scientific name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Big.	Glo.
M	1304	***Rhinolophus ferrumequinum***			p	2000	3000	i	C	G	A	B	C	A
M	1303	***Rhinolophus hipposideros***			p	250	500	i	C	G	B	B	C	B
M	1302	***Rhinolophus mehelyi***			p	250	500	i	R	G	B	B	C	B
F	5339	***Rhodeus amarus***			p	28981541	28981541	i	C	G	C	B	C	B
I	1087	***Rosalia alpina***			p	141916	258451	i	R	M	B	B	C	B
F	1146	***Sabanejewia aurata***			p	86478	86478	i	V	G	C	A	C	A
M	1335	***Spermophilus citellus***			p	11	11	colonies	R	G	C	C	C	B
R	1219	***Testudo graeca***			p	136	136	localities	C	G	B	A	C	A
R	1217	***Testudo hermanni***			p	162	162	localities	C	G	B	A	C	A

Kind of					Population in the area						Area assessment			
Omada	Cupid	Scientific name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Big.	Glo.
A	1171	***Triturus karelinii***			p	24	24	localities	C	G	B	A	C	A
I	1032	***unio crassus***			p	49425850	49425850	i	R	M	B	A	C	A
M	1354	***Ursus arctos***			p	1	2	i		G	C	B	B	B
M	2635	***Pre-melon peregusna***			p	2	2	localities	R	M	C	B	C	A

Team: Enter the code of the corresponding species group (A = Amphibia, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles).

Sensitivity (S): This field indicates whether disclosure of the information provided for a certain species could be detrimental to its conservation, for example because the species is subject to illegal collection and disclosure of the information on the form would actually increase this threat. In this case, a 'yes' is indicated in this field.

Not found (NP) (optional): In cases where a species for which a site was originally designated is no longer found in that site, it is strongly recommended that this is indicated by the symbol 'x'.

Type (T): since many species of fauna, and in particular many bird species, are migratory, the site may be important for various aspects of the species' life cycle. These aspects are classified as follows:

- Permanent (p): the species occurs in the locality throughout the year (non-migratory species or plant, resident population of a migratory species).
- Reproductive (r): the species uses the site to nest and raise chicks
- Concentration (c): the species uses the site for staging or roosting or stopping during migration or for changing wing outside its breeding site and excluding overwintering.
- Management (w): the species uses the site during the winter

When a non-resident population is present in a place for a period longer than one season, this population shall be reported in the appropriate fields.

Size: As far as population levels are concerned, it is important to always indicate the known population data, as far as they are known. If the population size is known, both fields (min. (min) and max (max)) with the same value. Where it is more appropriate to give a population interval, the estimated values for the lower limit (min) and the higher limit (max) of this interval shall be filled in. When the population interval is not known, but information is available on either the minimum or maximum population size, the missing value for the interval shall be estimated.

When even a rough estimate of the population size cannot be made, the type of population (e.g. permanent) is indicated and a value of DD (incomplete data) is marked in the 'data quality' field. In this case the fields for population size can be left blank and the field for population levels (species common (C), rare (R), very rare (V), or present (P)) can be used instead.

Unit: the unit of the population value is indicated in the corresponding field. Recommended units are individuals (= i) or pairs (= p) where possible, otherwise it is recommended to use the most precise units available according to the standard list of population units and codes.

Population level category (Cat.): This field should be completed when the data are incomplete (DD) and no estimate can be given in terms of population size or to complete quantitative estimates of population size. The same applies as mentioned in the previous paragraph for the size.
Data Quality (D.qual.): Indicate the quality of the data using the following code: G = 'Good', M = "Moderate", P = "Insufficient", DD = "Data incomplete".
Population (Pop.): the size and density of the population of the species occurring in the locality in relation to t h e populations occurring in the national territory. For this criterion, an estimate of the % in orders of magnitude is used based on the following scaled model: A: 100%>=p>15%, B: 15%>=p>2%, C: 2%>=p>0%, D: Insignificant population **Conservation Grade (Con.):** Degree of conservation of habitat features important to a particular species and potential for restoration. A: Excellent conservation, B: Good conservation, C: Moderate or limited conservation
Isolation (Iso.): The degree of isolation of the population occurring at the site relative to the natural range of the species. A: (Almost) isolated population, B: Population not isolated but on the edge of the range, C: Population not isolated within the wider range
Total Conservation (Glo.): Overall assessment of the site's value in terms of conservation of the species. A: Excellent value, B: Good value, C: Adequate value
Other Categories: Justification for the entry of each item based on the following categories. A: National Red List species, B: Endemic species, C: Species covered by an international convention (including the Bern, Bonn and Biodiversity Conventions), D: Other reasons

4.1.6 Recording of the main characteristics of all species of cryptopters in the study area

The Agreement on the Conservation of European Bats (UNEP/EUROBATS), recognising the adverse effects that the installation and operation of wind farms often has on bats, commissioned, already in 2003, the relevant Working Group of the Advisory Committee to investigate the problem and prepare a guidance document. The Greek version of the updated guidelines, which can be applied to larger wind farm projects in urban and rural areas, onshore and offshore wind farms, is available on the Ministry of the Environment's website.

The study area, although it belongs to a SPA and therefore its fauna is not assessed, is within the distribution range for 10 bat species belonging to Appendices II & IV of Directive 92/43/EE, *Rhinolophus hipposideros, Rhinolophus ferrumequinum, Rhinolophus euryale, Rhinolophus blasii, Rhinolophus mehelyi* and *Myotis capaccinnii, Myotis emarginatus, Myotis myotis, Myotis blythii, Miniopterus schreibersii* as shown in the following distribution maps of the "National Action Plan for 10 species of Chiroptor" (Georgiakakis 2021). Their conservation status based on the 4th National Report under Article 17 of Directive 92/43/EEC for the period 2013-2018 is Unknown for *Rhinolophus mehelyi* , Favourable (FV) for *Rhinolophus hipposideros* and Unsatisfactory-Inadequate (U1) for the remaining eight species, while *Rhinolophus mehelyi* is listed in the Red Data Book in the Vulnerable (VU) risk category both in Greece and internationally.

In addition, as the field survey area extends to the Natura 2000 "BG0001032" of neighbouring Bulgaria, which concerns habitat types and fauna, the species that may be affected by the project will also be examined, which are the chironomids *Barbastella barbastellus, Miniopterus schreibersii, Myotis bechsteinii, Myotis blythii, Myotis capaccinii, Myotis emarginatus, Myotis myotis, Rhinolophus blasii, Rhinolophus euryale, Rhinolophus ferrumequinum, Rhinolophus hipposideros* and *Rhinolophus mehelyi*. Of these species, only ***Barbastella barbastellus, Myotis bechsteinii* and *Rhinolophus blasii* are Vulnerable (VU)** and fall within the study area according to the European Union distribution maps) and their characteristics will be presented below.

***Myotis capaccinii* -Water myotis: LC (GR), VU (International)**

Myotis capaccinii is a medium-sized bat with a wingspan of 23 to 26 cm and a weight of 7-10 grams. Its fur is grey with a brownish tint on the back and a whiteish grey on the abdomen. It has characteristically large and strong feet (more than half the length of the shin) with long hair. Its goat is slightly "S" shaped, which allows it to be easily distinguished from the similar species *Myotis daubentonii*.

Its maternity colonies consist of 30-600 individuals and are formed in caves and mines, and are often mixed with other species of Hymenoptera, such as *Miniopterus schreibersii*, which adds great management value to its shelters. Births take place between May and June, while in eastern Greece they may begin as early as late April. It gives birth to a young and the young suckle until about the end of July. Mating takes place in the autumn. Most of the females (about 70%) mature reproductively in the first year, while males mature from the second year.

The Footed Myotis is not considered a long-distance migratory species, as its maximum seasonal movements are in the range of 100 to 150 km, while it uses caves and mines as resting stations. During the night it can move over distances of more than 20 km (in Greece it is more than 26 km) when moving from its shelters to feeding sites. In our country, the species appears particularly mobile as during the rotation of refuges during the summer season, they can be up to 39 km apart.

It feeds mainly on arthropods (mainly insects), such as diptera (of the family Chironomidae), hairworms, moths and hymenoptera. It can also capture small fish (e.g. cauliflower) from the surface of the water.

M. capaccinii prefers karstic areas rich in wetlands (slow-flowing rivers or large lakes) and shrublands, at altitudes up to 1200 m (in Greece it has been found up to 1120 m). The species occurs mainly in areas with Mediterranean and mild continental climates, rich in caves or mines.

Apart from underground shelters (caves and mines), where it usually forms colonies of tens or hundreds to thousands of individuals, the species can rarely be found in other types of shelters such as buildings, bridges and rock crevices. It often forms mixed colonies with other species, which adds great management value to its shelters.

It forages over calm water surfaces (river basins with significant riparian vegetation and near large lakes). It hunts by flying in large circles very close to the water surface (even at sea or in lagoons), and captures its prey with its uropath. It can also, using ultrasound, sense vibrations on the water surface and capture prey.

of submerging his feet below the surface of the water. Its dependence on water makes it vulnerable to wetland pollution. Occasionally, it forages in forests and shrublands (Davy et al. 2007).

The total population size was estimated at approximately 7,000 - 10,000 people with an unknown trend. The estimate of population size is considered to be rough, as it was obtained using a limited amount of data (EEA 2019). According to the Database for the Chiroptons of Greece, nearly 3800 individuals have been counted in 20 refuges (Georgiakakis and Papamichael 2020), but the actual number is probably higher.

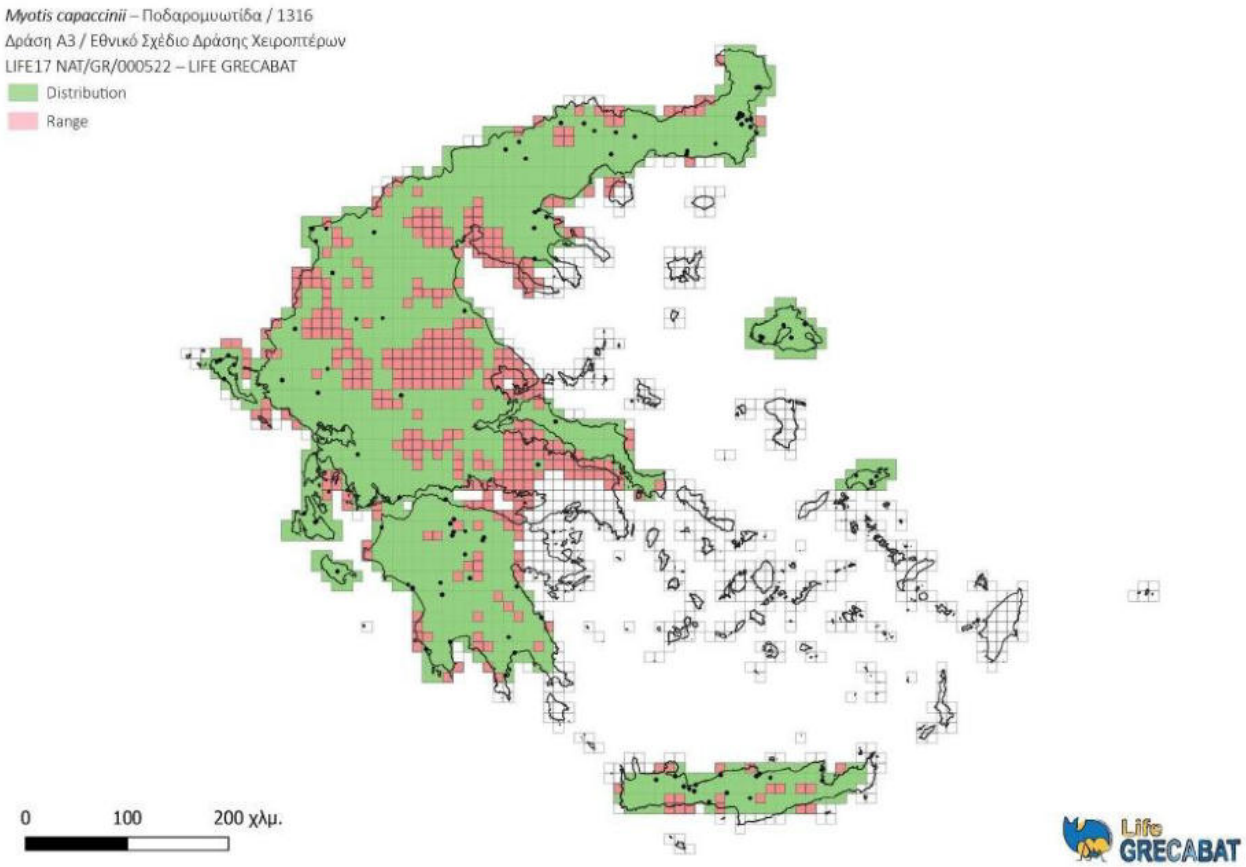


Figure 4.1-1 Distribution and range map of *Myotis capaccinii*. Black dots indicate the locations of confirmed presence.

***Rhinolophus mehelyi* - Rhinolophus mehelyi Méhelÿ: VU (GR), VU (International)**

The species *Rhinolophus mehelyi* is of moderate size size, slightly larger than *R. euryale* and smaller than R. ferrumequinum, with a wingspan of up to 34 cm and a weight ranging from 10 to 23 g (Wilson & Mittermeier 2019). The abdominal and facial fur is pale (almost white), while on the back it is greyish-brown. Most adult individuals have darker hair around eyes, like a "mask", which is sometimes observed in other species of the genus. The upper projection of the saddle is slightly rounded, and only in this species is the lanceolate narrowed sharply from the middle to the tip. In the fourth toe the first phalanx is less than half as long as the second, unlike in *R. blasii.*

Its mother colonies rarely exceed 500 individuals. In autumn it forms dense aggregations of males and females in caves, at close distances, where mating takes place. In both winter and summer, they often form dense aggregations with other species (*R. ferrumequinum, Miniopterus schreibersii*, which adds great management value to their shelters). Births occur from early June to mid-July. Females mature reproductively in their second or third year of life and give birth to a single young, which begins to fly out of their shelter after about a month. Males reach reproductive maturity in their second year of life. The maximum recorded age is 12 years.

It is a mostly epidemic species and the maximum recorded seasonal movements are 90 and 94 km in Portugal and Bulgaria respectively.

Its diet consists mainly of moths (moths), and to a lesser extent of beetles, tooth beetles, diptera and other insects.

R. mehelyi prefers karstic areas of low or moderate altitude (up to 535 m in Greece) with caves, which it uses as shelters. It also forms colonies in mines and less frequently in buildings and cellars.

It seeks its food in areas with low vegetation (arable land, steppe areas) and few trees, but also in oak forests and olive groves. It has a flexible flight that allows it to forage close to the ground. It occasionally hangs from branches of tall plants and scans the surrounding area for passing insects. The total population size was estimated at approximately 500 - 1,000 individuals with an unknown trend. The estimate of population size is considered to be rough as it was derived using a limited amount of data (EEA 2019). According to the Database for the Chiroptiles of Greece, nearly 1,300 individuals have been counted in 6 refuges (Georgiakakis and Papamichael 2020), but the actual number is undoubtedly higher.

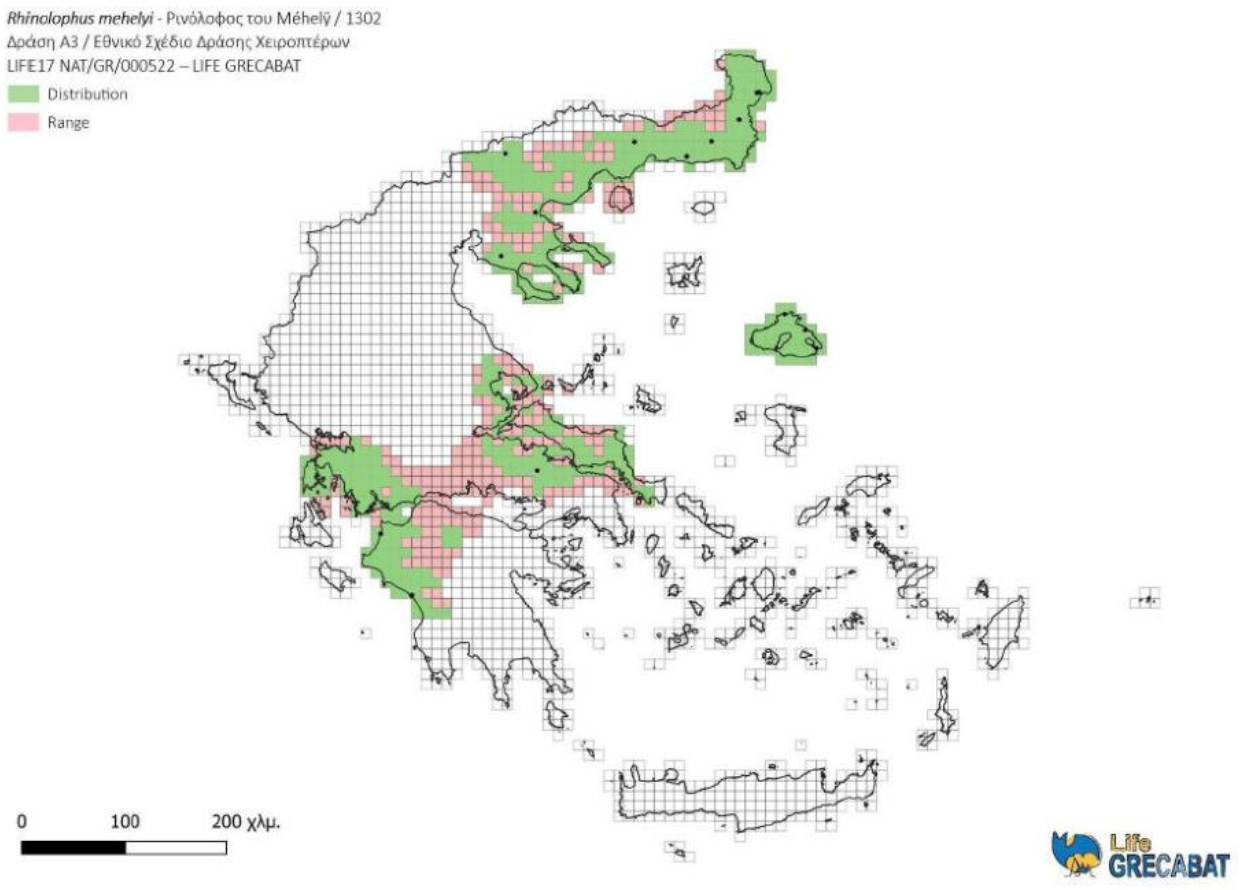
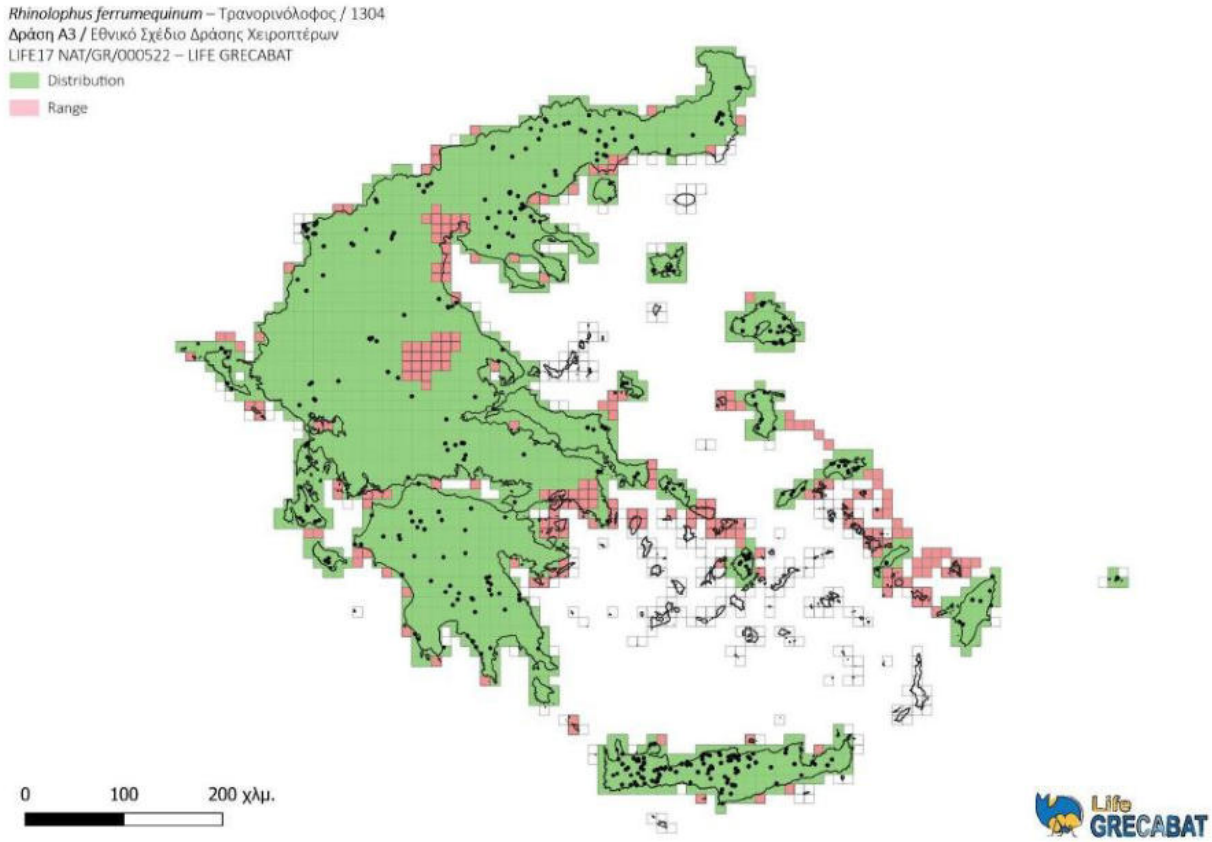


Figure 4.1-2 Distribution and range map of *Rhinolophus mehelyi*. Black dots indicate locations of confirmed presence.

Rhinolophus ferrumequinum - Rhinolophus ferrumequinum

The crinoid bat (*Rhinolophus ferrumequinum*) is a European species of bat found mainly in Europe, Africa, South Asia and Australia. It has a characteristic horseshoe-shaped nostril, hence its name. It is the largest species of all other similar European bats and is thus easily distinguishable from them. This bat prefers to live permanently in an area, travelling between 20 and 30 km to change nests in winter and summer, with the longest movement recorded at 180 km. It feeds on beetles, moths and other insects of fields and forests. Finally, the species is known to be the longest-lived (among European bats) with some individuals living more than 30 years.

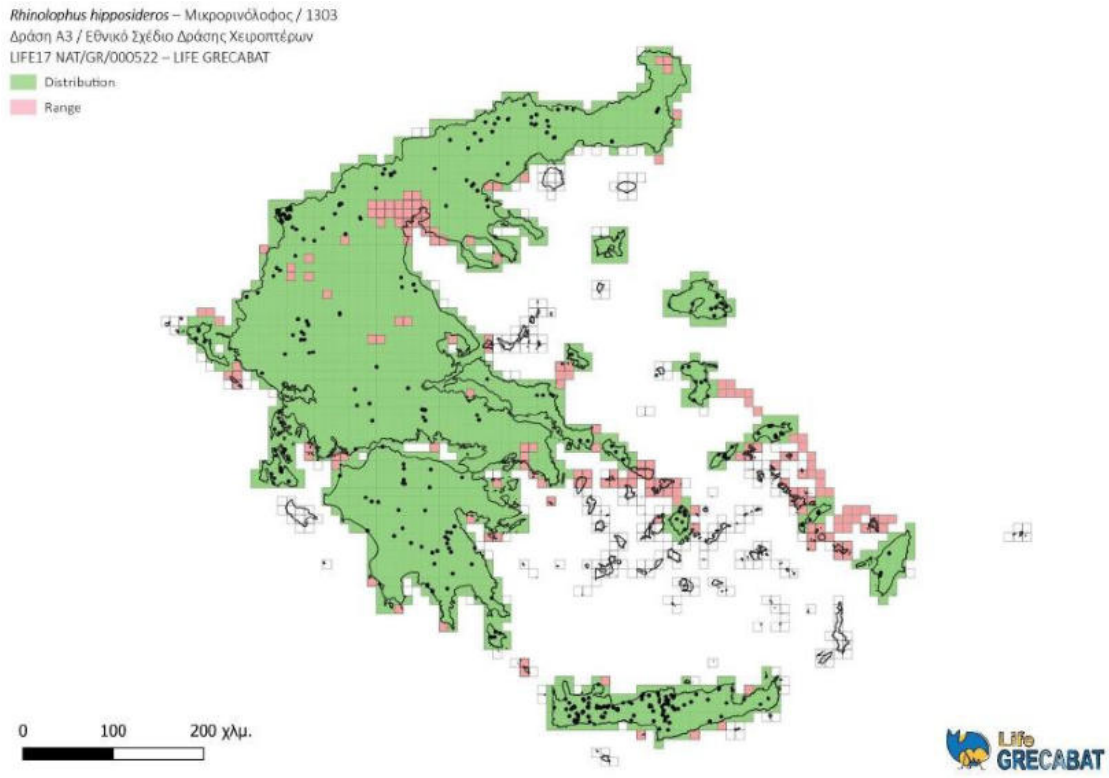


Εικόνα II-2. Χάρτης εξάπλωσης (Distribution) και εύρους (Range) του είδους *Rhinolophus ferrumequinum*. Με μαύρες κουκίδες δείχνονται οι θέσεις επιβεβαιωμένης παρουσίας.

Rhinolophus hipposideros - Small Rhinolophus

The micro-nosed bat is one of the smallest bats in the world, weighing only 5-9 grams, with a wingspan of 192-254 mm and a body length of 35-45 mm. The species gets its name from its characteristic horseshoe-shaped nose. The microrhinolophus lives in caves located near small forests of holly or even toadstools.

It has strong legs that it uses to hold on to rocks and branches, while she can see well, despite her small eyes. Like most bats, the microrhinolophus lives in colonies and hunts its prey by echolocation, i.e. emitting ultrasound from its mouth. Micro-nosed bats do not move far from their roosting site, with the average distance between their summer and winter roosts being 5-10 km, although the longest distance recorded is 153 km.



Εικόνα ΙΙ-1. Χάρτης εξάπλωσης (Distribution) και εύρους (Range) του είδους *Rhinolophus hipposideros*. Με μαύρες κουκίδες δείχνονται οι θέσεις επιβεβαιωμένης παρουσίας.

Rhinolophus euryale - Midnose Dolphin: VU (EU)

R. euryale spreads to all countries and some Mediterranean islands (Corsica, Sardinia, Sardinia, Sicily, Rhodes, possibly also Cyprus), except Libya and Egypt. It is present in all Balkan countries and an isolated population is found in southern Slovakia and northern Hungary. It is also found in SW Asia in a zone between the Caucasus and the Persian Gulf and on the Iranian border with Turkmenistan.

In Greece, the mesorhinolophos has been found in almost all of the mainland and on 12 islands (including the Peloponnese and Euboea, Figure II-3), but is absent from the Cyclades and Crete. Its distribution in our country is probably wider. Most of the known sites of the species are in Macedonia and Thrace, but the seven largest colonies (200-500 individuals) are scattered throughout its range: Eastern Macedonia and Thrace, Western Macedonia, Western Macedonia, Central Greece, Peloponnese, North Aegean and Ionian Islands. The highest abundance of the species has been observed in these regions.

Populations of *R. euryale* usually consist of large central summer and winter colonies surrounded by smaller satellite colonies. Central colonies may consist of a few thousand individuals, although usually no more than 1000, while satellite colonies may consist of a few tens to hundreds of individuals (Dietz and Kiefer, 2016). Both summer and winter refugia are caves and mines (outside of limestone areas). In the northern part of its distribution, however, it forms maternity colonies mainly in buildings, as caves in these areas are very cold. They usually form dense aggregations with other species of *Rhinolophus*, but also with species of

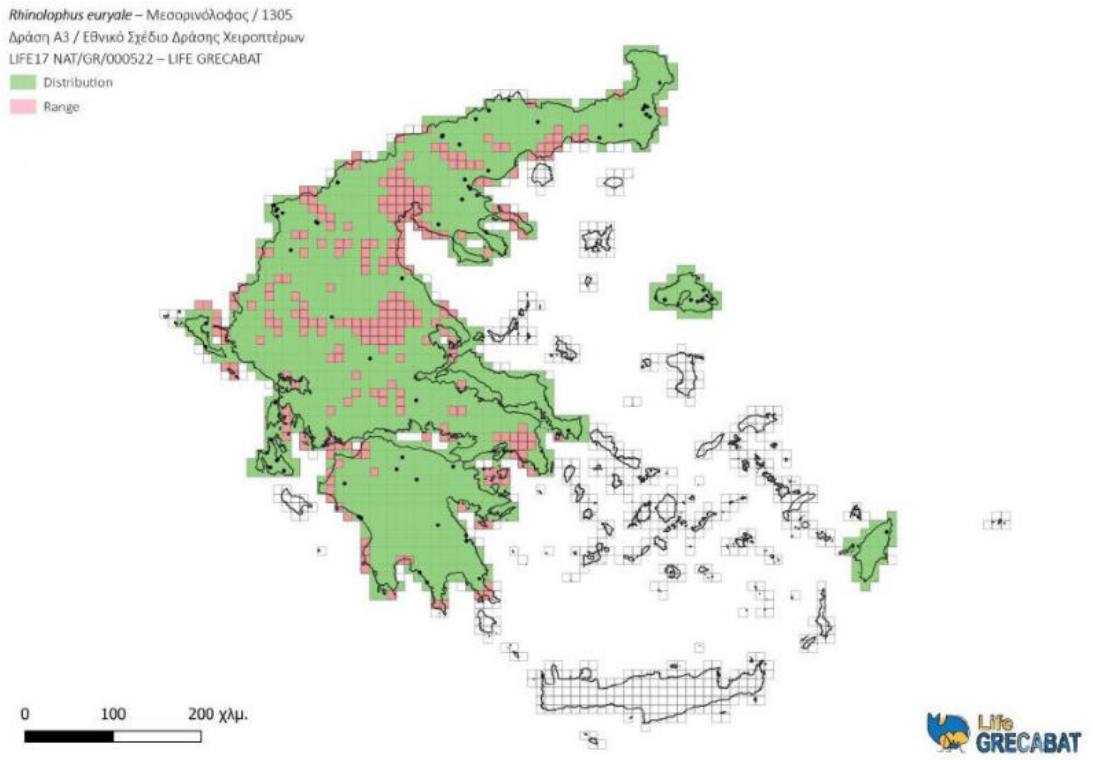
genera *Myotis* and *Miniopterus*, which gives great management value to its reserves.

It prefers karstic areas of low or moderate altitude (usually below 1000 m) with caves, which it uses as shelters. It is mainly an epidemic species and the distances between summer and winter refuges are usually less than 50 km.

Its feeding areas are located in forested areas, mainly broadleaf forests, riparian forests, Mediterranean shrubs and tree plantations (olive groves etc.), but it avoids coniferous forests and open areas. The known distances between its shelters and feeding sites range from 1,5 to 24 km.

The Mesorhinolophus hunts its food at the edge of forests or above the trees, but its extremely agile flight allows it to hunt among dense vegetation. It consumes its food in flight, although it occasionally hangs from perches and scans its surroundings for passing insects. It feeds mainly on small moths, but also on diptera (family Tipulidae) and small beetles.

Females are reproductively mature usually after their second year of age and give birth after mid-June or July to a cub, which becomes independent after about 4 weeks. Young females have their first litter at the age of 2-3 years. The maximum recorded age is 13 years.



Εικόνα II-3. Χάρτης εξάπλωσης (Distribution) και εύρους (Range) του είδους *Rhinolophus euryale*. Με μαύρες κουκίδες δείχνονται οι θέσεις επιβεβαιωμένης παρουσίας.

Myotis emarginatus - Myotis em*arginatus*

It is distributed throughout the Mediterranean region, including several islands. It spreads north as far as Belgium, South Holland and South Poland. In Germany it occurs only in climatically warmer areas (e.g. Rhine valley), and there is a notable gap in the distribution of the species between Luxembourg and Poland. It also spreads along the Balkan Peninsula, parts of Ukraine and the Southern Caucasus. In addition, it is found in NW Africa and Asia Minor. In the Near East, the Arabian Peninsula and Central Asia as far as Afghanistan.

In Greece it is a common species, as it has been reported in several locations throughout the mainland, as well as in Crete, Euboea, the Peloponnese and 15 islands of the Aegean and Ionian Seas. Most known locations and several important colonies are found in Eastern Macedonia and Thrace, Crete and the Peloponnese, but the greatest abundance has been recorded in central Macedonia, as one of the world's largest colonies is hosted near Sidirokastro.

In the southern part of its distribution, including Greece, the Pyrrhomyotis forms colonies mainly in caves and mines throughout the year, less frequently in buildings and on rock shelters. It occurs from sea level to 1800 m altitude, but in Greece so far it has been found up to 1380 m.

It is usually found in broad-leaved forests with a clear preference for deciduous trees and shrubs. It prefers landscapes with a variety of habitats, as well as riparian forests and low vegetation ecosystems. It prefers sloping sites rather than open areas used by other species. In eastern and northern Europe it is often observed feeding in anthropogenic habitats such as cattle and sheep pens, orchards, parks and gardens. It appears to avoid coniferous forests or uses them little in relation to their availability. It usually moves along forested ledges and watercourses.

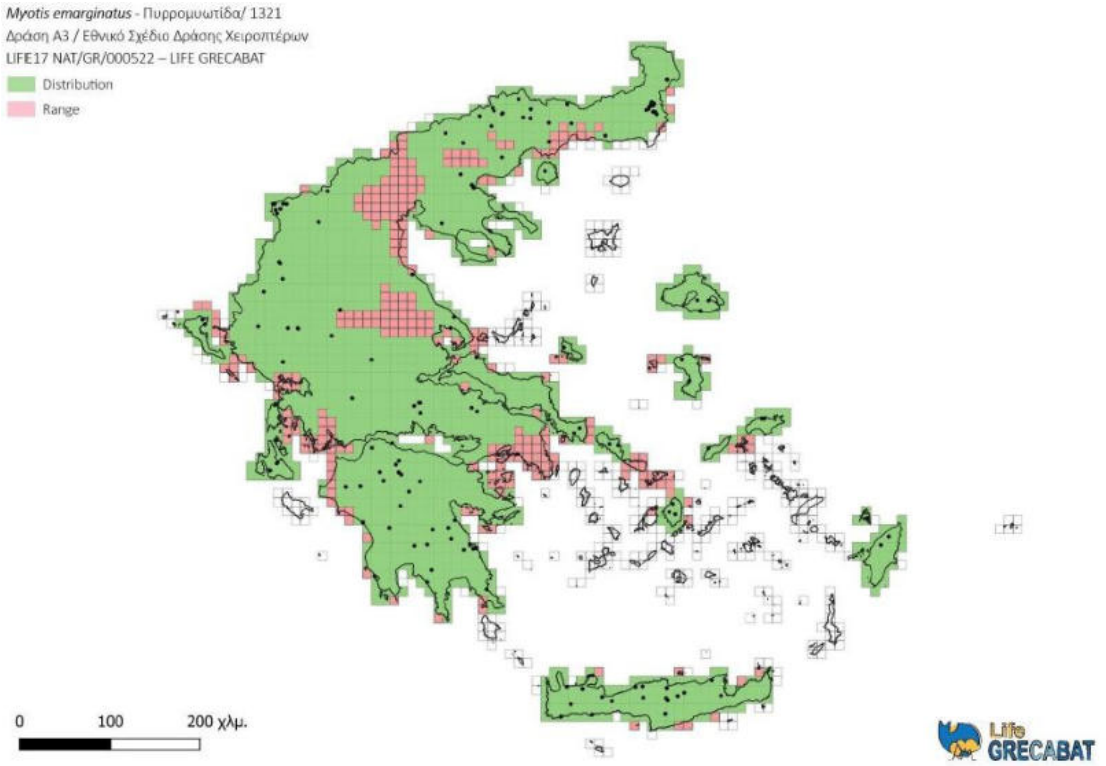
The Tyrannulet captures most of its prey by gliding over surfaces. It hunts near vegetation, but also within the canopy, collecting insects above the leaves. It may also search for prey near the ground. It typically forages in lush scrub and grasslands, and also around livestock facilities, where it finds abundant flies around the droppings of livestock. It is dependent on the presence of unevenly structured forests, woodland grasslands and traditional orchards.

Maternity colonies consist of dense aggregations of mainly adult females and juveniles, sometimes or in mixture with other species (genera *Rhinolophus, Myotis*, and *Miniopterus*), which adds great management value to its refugia. Breeding colonies use a network of adjacent refugia and often number 20 to 500 females, sometimes up to several thousand, and include some adult males. She gives birth to one young, rarely two, from late May to mid-July. The lactation period lasts 25-35 days. A few females mate from the first autumn, with the majority of them mating in the following year. Maternal colonies are often abandoned in August. The maximum recorded age is 18 years.

The Tern is considered to be an epidemic species, as the longest recorded seasonal movement distance is only 105 km. Since few wintering sites are known, the species is likely to move over longer distances. In some areas the species disappears during the winter and

is not spotted again until spring. In search of food, the species moves up to 12.5 km from its shelters. The foraging grounds are 50-70 hectares in size, within which there are up to 6 central foraging grounds, which it visits every night.

The diet of the Tidepool consists mainly of spiders and phallopods, secondarily of diptera, lepidoptera and neuroptera, and to a lesser extent of coleoptera and hymenoptera. Flies of the genus *Musca* constitute the major proportion of the residues in the faeces of stall-feeding individuals.



Εικόνα ΙΙ-7. Χάρτης εξάπλωσης (Distribution) και εύρους (Range) του είδους *Myotis emarginatus*. Με μαύρες κουκίδες δείχνονται οι θέσεις επιβεβαιωμένης παρουσίας.

Myotis myotis - Myotis myotis

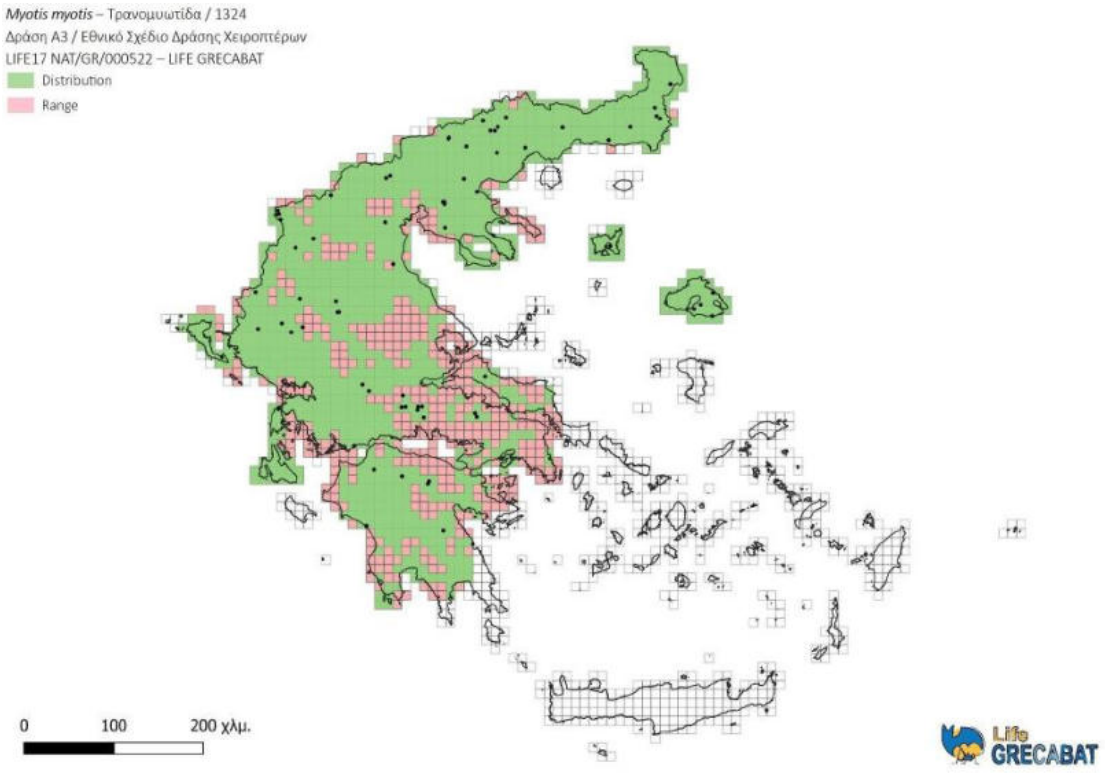
It is found throughout Europe, as far north as Poland and Ukraine, with a few records in the southern end of Great Britain and Sweden. Eastwards it is found as far east as Turkey and the Middle East.

In Greece, Tranomyotida has been reported in several continental areas of all geographical regions, Euboea and the Peloponnese, but also some large islands of the Ionian Sea (Corfu and Lefkada) and the northern Aegean Sea (Lesvos and Lemnos), but it is absent from Crete. Its actual distribution in our country is rather poorly known, due to its very close affinity and similarity to *M*. *blythii*. Most of the known locations, the most important colonies (100-1500 individuals) and therefore the highest abundance have been recorded in Eastern Macedonia and Thrace, Central Macedonia and Central Greece.

It occurs in a variety of habitats from deciduous forests (mainly open forests and forest margins) to semi-open and open grasslands and pastures, agricultural land, orchards and olive groves, from sea level to 2000 m above sea level.

m. altitude. In Greece it has been found up to 1950 m, but only four sites are above 1400 m. The species is usually associated with habitats with large gaps and little ground cover, because it hunts its prey on the ground and needs space for its manoeuvres. Although in smaller numbers, it also occurs in high altitude grasslands and pastures.
In Greece, as in other Mediterranean countries, colonies of the species are found in caves and mines throughout the year. In Central Europe, breeding colonies are mainly formed in buildings and occasionally in cellars or bridges. In summer the males are usually solitary in various types of shelters. In winter they take refuge in caves and mines, as well as in bunkers and rock crevices.
When searching for its prey, the species flies very slowly, at a height of 30 - 70 cm from the ground surface, in order to increase the chances of finding its prey. In addition to echolocation, prey detection is based on hearing and smell. When it detects prey by sound (rustling of insect wings, movement), it pounces, covering the prey first with its wings and then capturing it with its mouth. It consumes the small prey in flight, which it catches with its uropatagium or wing, while for the consumption of larger insects it hangs on to a neighbouring position.

The Tranomyotida forms, in underground shelters, large maternal colonies of 50-1000 females or more. Maternity colonies usually form in late March and last until August. They usually consist of adult females and their young, plus a few adult males. These males are not the most successful from a reproductive standpoint because the females prefer to mate with males outside the colony, which they expect in small aggregations and colonies in nearby locations. In Greece, it shares its refugia with other species (genera *Rhinolophus*, *Myotis* and *Miniopterus*), which adds great management value to its refugia. It gives birth in May to June (April in some Mediterranean countries) to a young that becomes independent after 5 to 8 weeks. Colonies disperse in mid to late August, when they begin to mate. Most females mature reproductively during their first and second year of life. Usually males attract females by "singing" from their shelters, where they form harems of up to 5 females. Maximum recorded age to date is 25 years.
M. *myotis* is not clearly a migratory species, although movements of up to 436 km have been recorded. Movements between summer and winter refuges are in the order of 50-100 km. During the night they travel 5 to 26 km to reach feeding grounds.
It usually feeds on large (> 1 cm) species of terrestrial arthropods, mainly beetles of the family Carabidae, and other arthropods such as limpets, spiders and beetle larvae. Seasonally or only sporadically it feeds on beetles of other families, onion-eaters, diptera of the family Tipulidae and orthopterans. In the Mediterranean region spiders may form a high proportion of its prey.



Εικόνα II-8. Χάρτης εξάπλωσης (Distribution) και εύρους (Range) του είδους *Myotis myotis*. Με μαύρες κουκίδες δείχνονται οι θέσεις επιβεβαιωμένης παρουσίας.

Myotis blythii - Myotis b*lythii*

It spreads to south-central and southern Europe (including Sicily, Cyprus, Crete and other smaller islands in the Mediterranean), south-west Asia from Asia Minor to the Caucasus region, Palestine and North Jordan to Kashmir, the Altai Mountains, Nepal, North India and North and Central China.

In Greece it has been found in a large number of locations throughout the mainland, Evia, Peloponnese, Crete and 14 other islands of the northern and southern Aegean and the Ionian Sea. The most known locations of the species are in Crete (51), Eastern Macedonia and Thrace (24) and the Peloponnese (22). The highest abundance has been recorded in Western Greece, Crete and the Peloponnese, while several large colonies (more than 250 individuals) have been recorded in the rest of the country, except in Western Macedonia, Epirus, the Ionian Islands and Attica.

It is usually found in shrub and grassland habitats, steppes, pastures, karstic fields and agricultural land from sea level to 2000 m altitude (1700 m in Greece). It largely avoids large, enclosed wooded areas, which are dominated by *M. myotis.* In Greece, as in other Mediterranean countries, the species forms colonies almost exclusively in underground shelters (caves, mines, etc.). In Crete in winter it is found only in mountain caves (above 1000 m), where it hibernates. Its winter shelters in the rest of Greece are largely unknown. In the northern part of its range it forms mother colonies in attics.

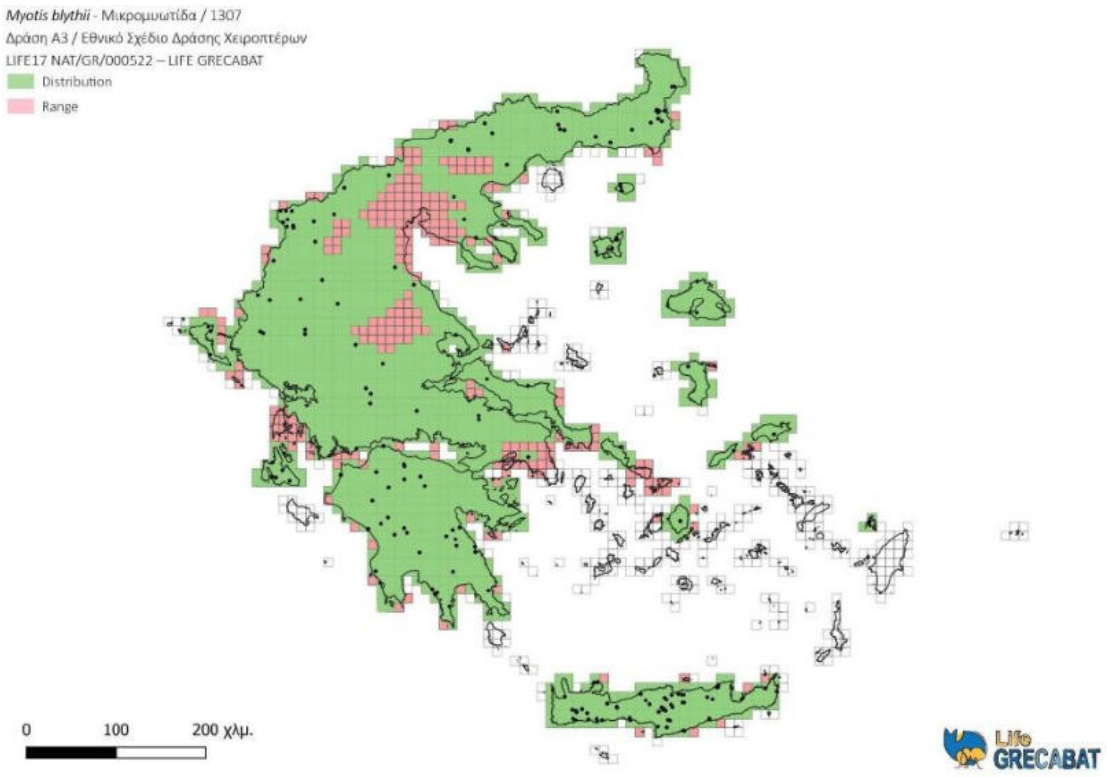
The Micromyotid can capture its prey either in flight or directly from the ground, depending on the availability of insects and vegetation. It flies slowly, at a height of 1-2 m above the ground, scanning the surface for potential prey. If a prey is spotted, it hovers briefly and pounces on it with outstretched

wings. It generally chooses open areas for foraging and can and does hunt in tall grass pastures rich in orthopterans. It also chooses forest margins for foraging where insect availability tends to be higher than in more homogeneous habitats.

Mother colonies can be hundreds or thousands of individuals in size and consist mainly of adult females and their young. Males are scarce in breeding colonies as they are mainly found in other refuges, singly or in small aggregations close to the parent colony. In Greece, breeding colonies in caves are usually mixed with other species (genera *Rhinolophus, Myotis and Miniopterus*) and number up to hundreds or a few thousand females, which adds great management value to its refuges. Females give birth between May and mid-June from a young. Juveniles begin to fly at 5-6 weeks of age. Colonies disperse in August, when mating begins. The maximum age recorded to date is 33 years.

The Micromyotid is considered an epidemic or occasional migratory species and its seasonal movements are usually limited to a few tens to 150 km. The longest recorded movement for the species is 488 km in a straight line, indicating that at least occasionally the species may at least make longer movements. Its summer and winter refuges are usually 15 km apart. The average recorded distance between shelters and feeding grounds is 4 - 7 km, with longer distances of 9 - 25 km for some feeding grounds.

It feeds on relatively large arthropods, with a preference for orthopterans (mainly crickets, grasshoppers and onion-eaters) and terrestrial coleopterans. However, when food availability is low, *M. blythii* can also prey on other species which suggests that its hunting strategy is quite flexible. Given the wide geographical distribution of the species, its diet is also quite broad and, in addition to orthopterans and coleopterans, includes lepidopteran larvas, mandarins (especially in the Mediterranean), dipterans of the family Tipulidae, hymenopterans and spiders, indicating that the species is opportunistic.



Εικόνα II-9. Χάρτης εξάπλωσης (Distribution) και εύρους (Range) του είδους *Myotis blythii*. Με μαύρες κουκίδες δείχνονται οι θέσεις επιβεβαιωμένης παρουσίας.

Miniopterus schreibersii - Winged Bat: VU (EU)

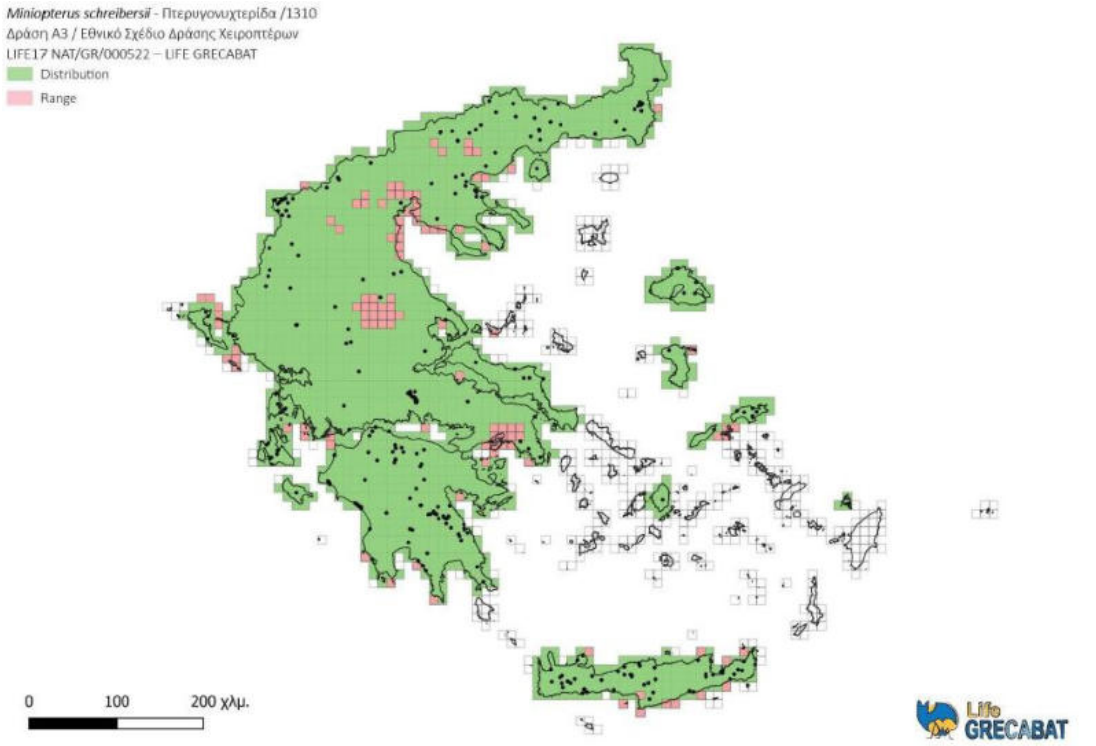
M. schreibersii spreads in southern Europe from the Iberian Peninsula east to northern and western Anatolia (Turkey) and western Georgia, north to central France, Slovakia and Romania, and south to Morocco, northern Algeria, Tunisia, northwestern and northeastern Libya, Syria, Lebanon, Israel and possibly Jordan, as well as most Mediterranean islands. Historical reports or occasional records exist for SW Germany, Switzerland and the Czech Republic.

In Greece, the species *M. schreibersii* is quite common, as it has been found in numerous locations in all geographical areas of Greece. Apart from Evia and the Peloponnese, it has been found on 13 other islands, in the Ionian, North and South Aegean and the Cretan Sea. It may have been recorded on Naxos and it is possible that it is present on other islands of the Cyclades. It has been recorded in very many places in Crete (53), the Peloponnese (47) and western Greece (38), while it seems to be relatively rare in the Cyclades, Attica and Epirus. Its greatest abundance has been recorded in western Greece, eastern Macedonia and Thrace, and the Ionian Islands, where its most important colonies are located. Very important colonies (more than 2000 individuals) are also found in Crete, Western Macedonia and Thessaly.

It is found in a wide range of habitats, from semi-arid steppes (in the south of its range), wet deciduous forest areas (in the north of its range) and Mediterranean scrub and woodland, generally at altitudes up to 1400 m. It forms colonies mainly in karst caves, which it occupies all year round, as well as in mines and other underground sites. Small aggregations or single individuals of the species can be found in numerous other locations, such as bridges, building attics and elsewhere. At the northern end of its range individual maternity colonies are formed on the roofs of buildings.

The Pteridoptera preys mainly on moths in open areas, but it has great flexibility in flight which allows it to forage in forest edges, gaps, under the forest canopy and close to vegetation. It also hunts over water bodies, but also around street lights, in orchards and parks. In contrast, dense pine forests and closed uniform deciduous or mixed forests are avoided. Its long wings allow it to fly fast (up to 55Km/h), but when needed, it maneuvers sharply with the help of its broad tail membrane. The species uses linear features of the landscape, such as forest boundaries, hedgerows and riparian forests, to move around.

The Winged Bat mates in September and early October and fertilization occurs immediately (not in the spring, as in most Chironomids), but implantation of the zygote takes place after hibernation. It gives birth to one young, in June or July. The young begin to fly at 40 days and are fully developed at 60-70 days. Females mature reproductively at one year of age and give birth to their first young at two years of age. Some colonies (both breeding and wintering) of the species number in the tens of thousands, but often the colonies are much smaller. The maximum recorded age is 16 years.
The species migrates seasonally between its winter and summer refuges. On average these are 40 to 100 km away, with maximum recorded movements of 422, 525 and 833 km in France and Spain. Foraging grounds are located up to 40 km from its refuges (usually 15-20 km). During the night individuals of the species visit one to nine individual foraging areas.
The diet of the species consists mainly of Lepidoptera (over 70%) and secondarily of Neuroptera and Diptera. It also feeds to a lesser extent on Trichoptera and Coleoptera.



Εικόνα II-10. Χάρτης εξάπλωσης (Distribution) και εύρους (Range) του είδους *Miniopterus schreibersii*. Με μαύρες κουκίδες δείχνονται οι θέσεις επιβεβαιωμένης παρουσίας.

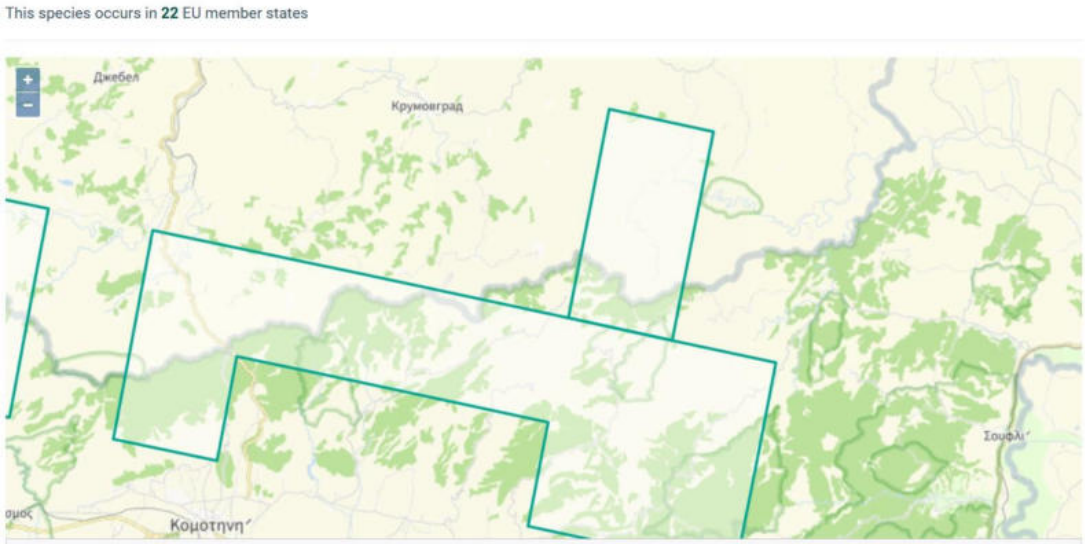
***Barbastella barbastellus* - Barbastelle: VU (IUCN - EU)**

Barbastellos (*Barbastella barbastellus*) is found from Portugal to Azerbaijan and from Sweden to the Canary Islands, where a subspecies was found. It has a short nose, small eyes and wide ears.

Barbastelle roost in crevices or behind loose tree bark all year round.
time, generally in mature deciduous forests, as well as in rock crevices and in human buildings. They migrate to underground roosting sites during the winter, although they may remain in tree roosts at the beginning of the breeding season. Winter roosting sites include natural caves and human structures such as basements, mines and warehouses. They are relatively hardy to cold conditions and usually hibernate in cold locations and exposed sites.

They feed mainly on moths, as well as flies and moths. The diet of Barbastelles appears to be one of the most restricted among European bats. This specificity in foraging habits probably indicates a higher vulnerability of this species to negative changes in moth population abundance. This could explain its current rarity throughout its range.

Below is a map showing the range of the species in the study area based on data from the European Union website.



Myotis bechsteinii - Bechstein's myotis: VU (IUCN - EU)

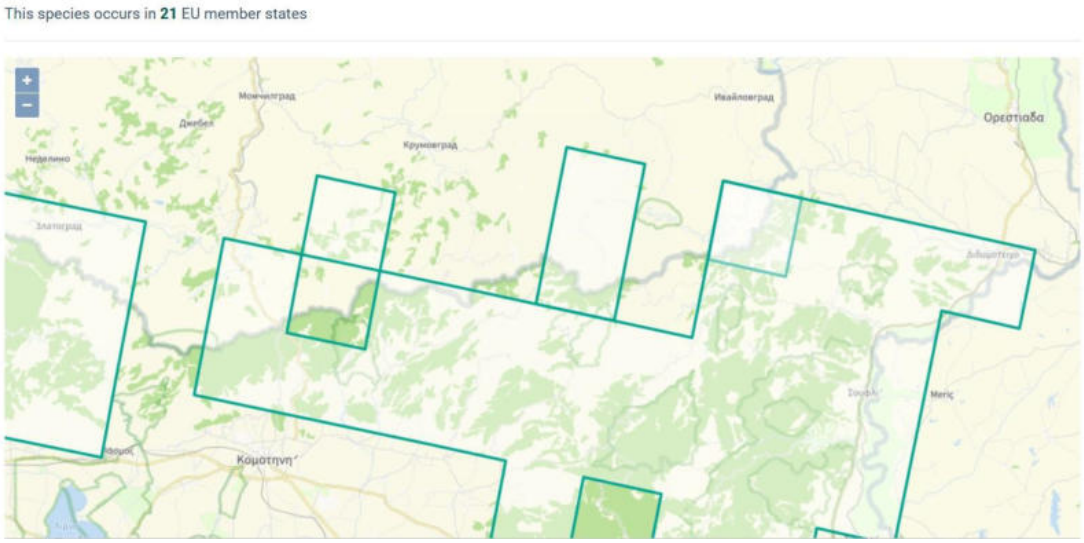
The Bechstein's myotis (*Myotis bechsteinii*) is a species of bat found in Europe and western Asia, living in extensive woodlands.

It feeds mainly on flying prey such as moths, diptera, neuroptera and other small nocturnal insects. Populations that have been cut off from forested areas turn to a diet of terrestrial insects and spiders that they catch from the ground. They usually forage within a mile or two of their roost and hunt mainly in the forest.

They use holes in trees, usually holes in woodpeckers, for perching. It has also been recorded using artificial nest boxes, but rarely takes up residence in human buildings. During winter, it hibernates in underground places and tree holes. Mating takes place in autumn and spring and late fertilisation means that young (one per female) are born early the following summer. Maternal colonies usually form in late spring.

Bechstein's myotis is specialized to inhabit forested areas and is rarely found outside of them. It is recorded in mixed forests in southwest Asia, but European populations prefer deciduous forests with high proportions of old trees. Beech and oak woodlands form a large part of the animal's habitat. They are also occasionally found in orchards, gardens and other cultivated areas.

Below is a map showing the range of the species in the study area based on data from the European Union website.



***Rhinolophus blasii* - Blasius rhinolophus: VU (IUCN - EU)**

R. blasii is a species with a broad but fragmented distribution. It occurs in the Balkans and the eastern Mediterranean (including several islands), Armenia, Azerbaijan, West Iran, the Southeastern Arabian Peninsula, Iran, Afghanistan and Pakistan, Eastern Sub-Saharan and Northwestern Africa.

It has recently disappeared from Italy and Slovenia. In Greece, the Blasius rhinolophos is a fairly common species and is found throughout the mainland, and so far it has been found on 22 islands of the Ionian and Aegean Seas, as well as in Evia, the Peloponnese and Crete. Most of its presence has been recorded in Crete (60) and Eastern Macedonia and Thrace (23). In these regions it has been recorded in comparatively high abundance, but Thessaly is the leader, as several hundreds of individuals have been recorded in the Melissotrypa cave. The next smallest colonies (a few hundred individuals) have been found in Eastern Macedonia and Thrace, Western Macedonia, Central Greece and Crete.

Little is known about the breeding habits of *R. blasii,* but mating takes place in autumn within the shelters. In Crete, juveniles fly as early as the beginning of June, probably when the climate of the previous spring is favourable, while in southern Bulgaria, births take place in late June. Females mature reproductively after their second year of age and give birth to a single young.

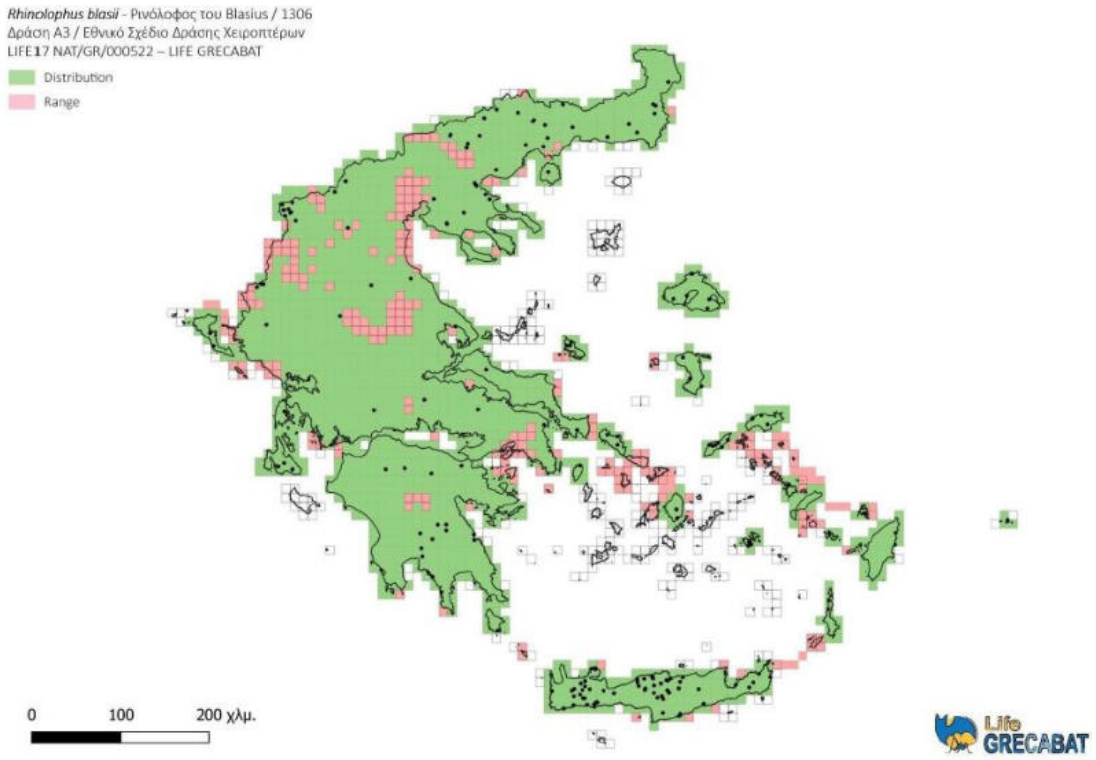
It is an epidemic species, with its summer and winter refuges being located at relatively close distances. Its feeding sites are located within a few kilometres of its refuges. In the area of the Bulgarian and Greek Rhodopes, the species feeds almost exclusively on moths, while studies in other areas of its range have found that it also feeds on cephalopods, diptera, trichoptera, hemiptera, neuroptera, etc.

R. blasii prefers karstic areas of low and medium altitude (rarely above 1000 m in Greece) with low vegetation and sparse trees. It usually forms colonies, with dense aggregations of a few hundred individuals, in karst caves and mines. It often shares its refugia with other species of the genera *Rhinolophus, Myotis* and *Miniopterus, which* gives its refugia great management value. It inhabits caves with mild temperatures (13.8 - 17 degrees Celsius).

It is a typical species of the Mediterranean landscape with a small-scale mosaic of open habitats and shrublands. It usually hunts in scrub, oak woodland and along ecotones in fragmented landscapes. It hunts exclusively in flight and systematically forages for insects. It can and does move very flexibly and captures

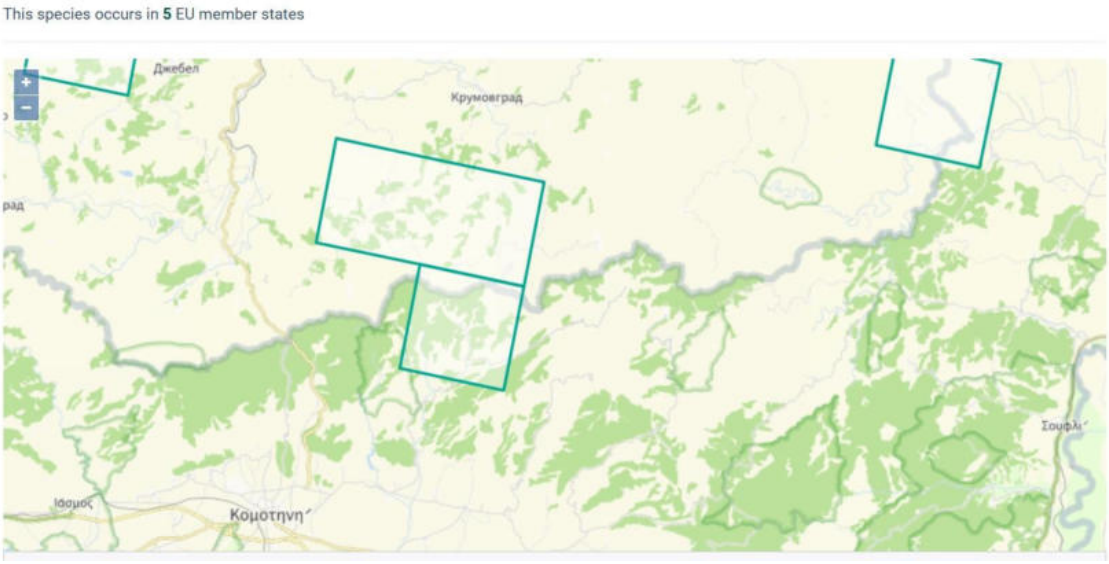
feeding near vegetation or the ground. It is a species that is quite dependent on the presence of water and is associated with watercourses and other water surfaces.

The conservation status of *R. blasii* (species code: 1306), based on the 4th National Report under Article 17 of Directive 92/43/EEC for the period 2013-2018, was assessed as Unfavourable - Inadequate (U1) and the overall trend of the conservation status as Unknown (Unk) (EEA 2019). The total population size was estimated at approximately 2100 - 5000 individuals with unknown trend. The population size estimate is considered to be rough, as it was derived using a limited amount of data (EEA 2019). According to the Database for the Chiroptons of Greece, nearly 6300 individuals have been counted in 36 refuges (Georgiakakis and Papamichael 2020), but the actual number is undoubtedly higher.



Εικόνα II-5. Χάρτης εξάπλωσης (Distribution) και εύρους (Range) του είδους *Rhinolophus blasii*. Με μαύρες κουκίδες δείχνονται οι θέσεις επιβεβαιωμένης παρουσίας.

Below is a map showing the range of the species in the study area based on data from the European Union website.



4.1.7 Capturing Study Area information on a Documentation Map

The following plan shows the boundaries of the Study Area based on google earth maps and overlay of land cover as defined in Corine Land Cover (2018).

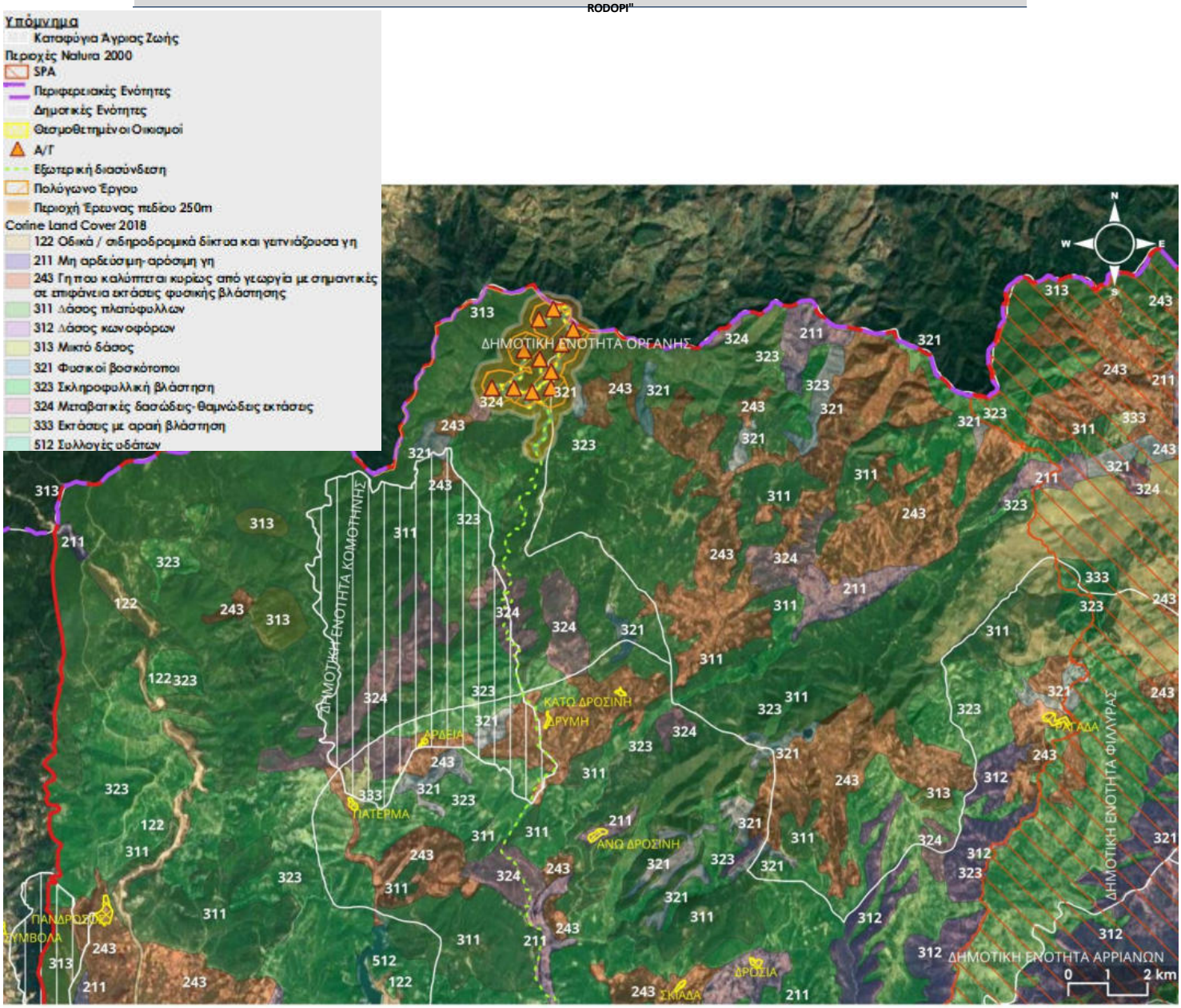


Figure 4.1-3 Map of part of the Study Area of the GR008 SPA with the Habitat Types.

4.2 Inventory and analysis of the elements of the natural environment in the Field Research Area (F.R.A.R.)

4.2.1 Detailed description of the Field Investigation Area (F.I.A.A.)

The field investigation area (FIR) within which the survey of the objects of protection of the GR008 SPA, i.e. the avifauna, is concentrated is the zone of 500m around the project polygons (squares A/G) and 250m on either side of the linear elements of the project (roads and electricity network). In addition, the elements of the Bulgarian EEZ BG0001032 "Rodopi - Iztochni" that may be affected, i.e. the handicap areas, are also investigated. The EEZ depicted in the figure below represents 0.72% of the area of GR008. A small part (10.52 % - 0.4m^2) of the field survey area extends within the Natura site "BG0001032". The field survey carried out covered an area of 5.857 km^2 .

According to the observations during the field survey, the site "Warrior" has as dominant forest species the Beech (*Fagus sp.*) and Oak (*Quercus sp.*) that extend in dense stands over almost the entire surface of the polygon. In some places, mainly in the central and northern part, some individuals of *Betula pendula* can be found, while the few gaps/openings that exist are mainly home to *Juniperus sp*. The altitude of the area varies from about 700-950 m and generally within the polygon there are steep gradients. Administratively, it is part of the prefecture of Rodopi and borders on Bulgaria to the north. Access is via a forest road network from the settlement of Drymi, while the condition of the road is quite good. The area is mildly grazed, while the landscape is sculpted by streams, with several springs and built watering troughs for livestock. In most of the area of the feeding area covered by the MPA, there is a deciduous vegetation cover dominated by oaks (*Quercus sp.*), whose distribution alternates with pine forest (*Pinus nigra*).

The vegetation types recorded in the P.E.P. and corresponding to Copernicus - Corine Land Cover (2018) are the following:

311 Broadleaf forest. A vegetation formation consisting mainly of trees, including shrubs in the understorey, dominated by broadleaf species.
Crown cover density is > 30 % or at least 500 individuals/acre density, with broadleaf trees representing > 75 % of the formation and a minimum tree height of 5 m.
321 Natural pastures. Grasslands under no or moderate human influence. Low productivity grasslands often located in areas with uneven ground, steep slopes and often including rocky areas or parts of other (semi-)natural vegetation. Natural grasslands are areas with herbaceous vegetation covering at least 50 % of the surface. In addition to herbaceous vegetation, areas of scrubby formations, scattered trees and mineral outcrops also occur. In this context, the term 'natural' implies that the vegetation grows with minimal human intervention (not mowed, drained, irrigated, sown, fertilised or stimulated by chemicals that may affect biomass production). Although human interference cannot be completely eliminated, it does not suppress the natural growth or species composition of the grasslands. It is possible to do maintenance mowing and shrub removal to prevent woody overgrowth due to natural succession, as well as sporadic extensive grazing with a few livestock units/acre. Typically visible

characteristics of natural pastures are their large area and irregular shape, usually far from larger settlements.

324 Transitional wooded scrubland. Transitional scrub and herbaceous vegetation with occasional scattered trees. May represent forest degradation, forest regeneration/recolonization, or natural succession. Areas representing the natural growth of forest formations, consisting of young broadleaf and coniferous species, with herbaceous vegetation and scattered solitary adult trees. The transition process can be for example natural succession on abandoned agricultural land, forest regeneration after damage of different origin (e.g. storm, avalanche), stages of forest degeneration caused by natural or anthropogenic stress factors (e.g. drought, pollution), reforestation after pruning and in formerly non-forested natural or semi-natural areas, etc.

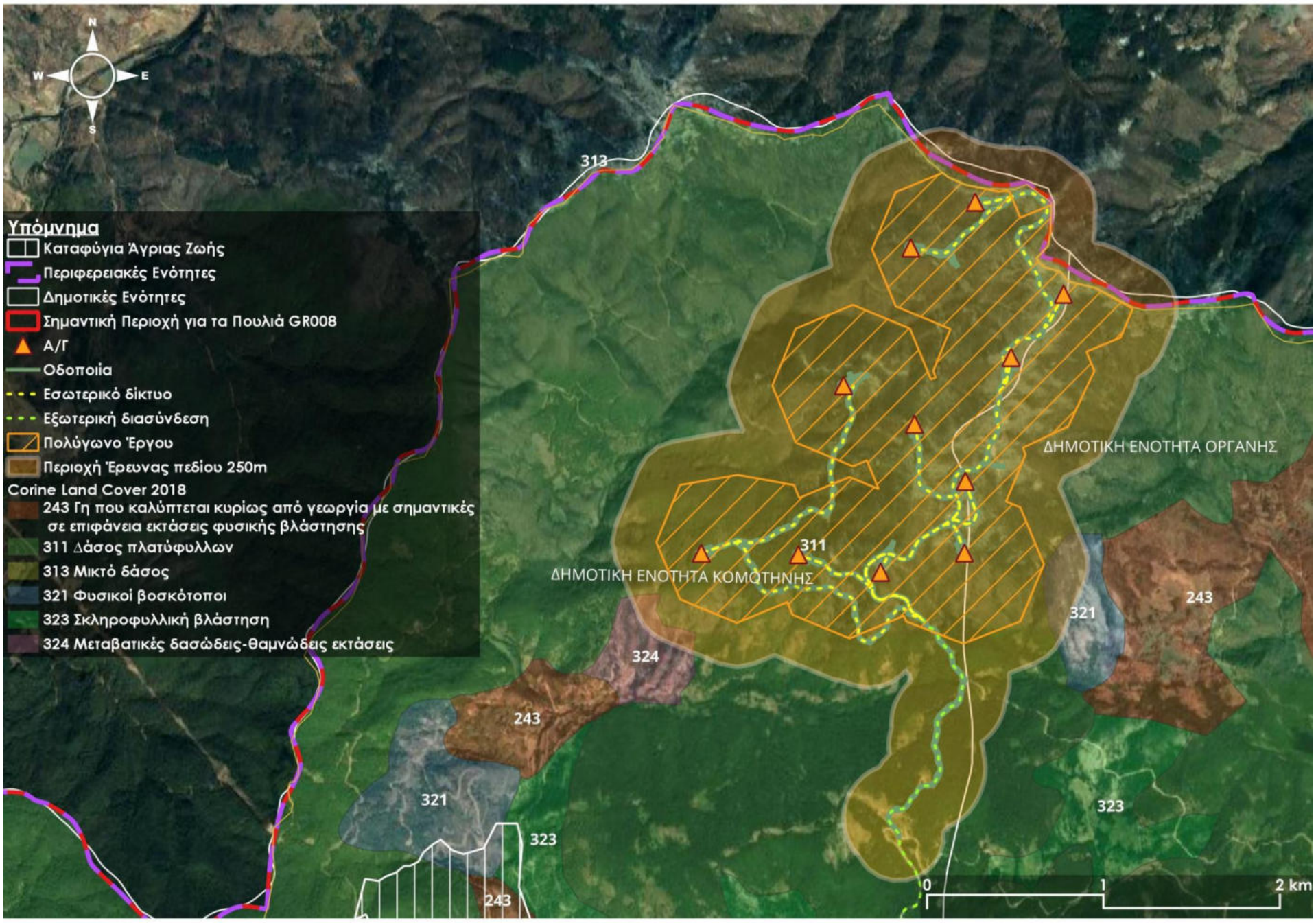


Figure 4.2-1 The area (MPA - light orange circle) within which the species characterisation of SPA GR008 is surveyed.

Figure 4.2-2 View of the field from the existing road.

Figure 4.2-3 The bushy vegetation and the broadleaf forest can be seen.

Figure 4.2-4 View of the hills in the project area and forested area.

The photos were taken by Dimitrios Voulgaris. Additional photographic material from the field survey area and the species observed are listed in the relevant appendix (10.2).

4.2.2 Methodology for data collection during fieldwork

On 23-25 March, 28-30 April 2023, 26-28 May 2023, 23-25 June 2023 and 25-26 October (14 days and **30 field counts for the avifauna** by all methods), a visit to the area "Polemistis" of Rodopi prefecture was carried out in order to record and observe mainly the avifauna but also other fauna elements e.g. mammals. The weather conditions were very good during the observations in March, April and June with sunshine, with light northerly winds, while in May there were cloudy weather conditions, rain at times and strong northerly winds. Temperatures ranged from 2^{o} C to 18^{o} C, 9-15^{o} C, 14-19^{o} C and 15- 27^{o} C in March, April, May and June respectively. Observations were made throughout the day. Regarding the October data, all flights were far outside the hazardous impact zone and therefore no relevant distance data are reported.

For the most complete recording of birds of prey or large birds, **2 Vantage points** were selected for the most complete recording of birds of prey. This choice was made based on visibility, access and best control of the study area. The duration of each recording was 3 hours, and if a raptor was detected, its course on a map, flight altitude, species, behaviour and where possible sex and age were noted. The observer was

equipped with a 20X60 telescope and 10X42 binoculars, as well as a camera accompanied by a 150-600mm telephoto lens for the documentation of the items.
Five fixed point count stations were selected to record ostriches, opossums and other small birds. It is a method that has effective application in both closed forest ecosystems of dense vegetation and open habitats of lower vegetation. With this method, the observer remains on site for 15 minutes recording the birds seen or heard at a distance.
Also **2 Foot line transects** were defined. The routes traverse portions of the species' habitats in the study area sample plots and are implemented on foot.
Regarding the nocturnal predators, their recording was done using bioacoustic stations and specifically the *Song Meter Micro* device of the company Wildlife Acoustics. The analysis of the mp3 files stored on the device was performed using the AviaNZ software (v3.2.3). A total of **3 night recording sites** were selected where the device was placed and the recordings were set to last from 9 pm to 4 am.
Also **3 mammal monitoring cameras** were placed in places where there were signs of presence such as tracks, paths, etc.

As for the handwheel records, these were made on 25-26 October 2023 under conditions of mild temperature 18-22^{o} C, low wind intensity and a period of mild rainfall. Special recording devices were placed at specific locations in the field survey area (FSA). The method used is based on the recording-recording of the voices (usually ultrasonic) echolocation and social calls emitted by the hand flaps during flight. Ultrasonic receivers with an integrated digital audio recorder, type BATLOGGER A (Elekon AG, Luzern, Switzerland) were used for the recordings. The recorders were placed at a height of 2.5-3 m. The BatExplorer software was used to manage the recordings and analyse the recorded sequences
2.1.9.1 The analysis was mainly based on voices from the search phase (phase 1) of the sequence, based on the European bats - Elekon library. The calls of this phase are emitted when bats "scan" the surrounding area in search of solid bodies (e.g. insects, trees, rocks) and are the most stereotypical and characteristic of the species.
To investigate the chironomid fauna of the project area, recording devices were installed at 8 sites within the project and adjacent PIP. For the project at the "Warrior" site, 8 overnight sampling events were conducted within the project PIP, 6 of which were conducted in the A/G installation area and 2 of which were conducted in the portion of the PIP of the underground interconnection line that falls within the feeder area. The purpose was to cover the activity of the chironomids in the project area and in the individual habitats they occupy or with which they are adjacent.

The instruments used throughout the research include:
- Private 4X4 vehicle for access to the area and the local road network.
- Supervisory tools used: 10x42mm binoculars, 20x60mm telescope and camera accompanied by a 150-600mm telephoto lens
- Species identification field guides: a) "Birds of Greece, Cyprus and Europe" E.O.E. 2007, Athens. b) Benny Gensbol, 1989. "Birds of prey of Britain and Europe". Collins, London.

- Ultrasonic receivers with integrated digital sound recorder, type BATLOGGER A (Elekon AG, Lucerne, Switzerland)
- Software BatExplorer 2.1.9.1

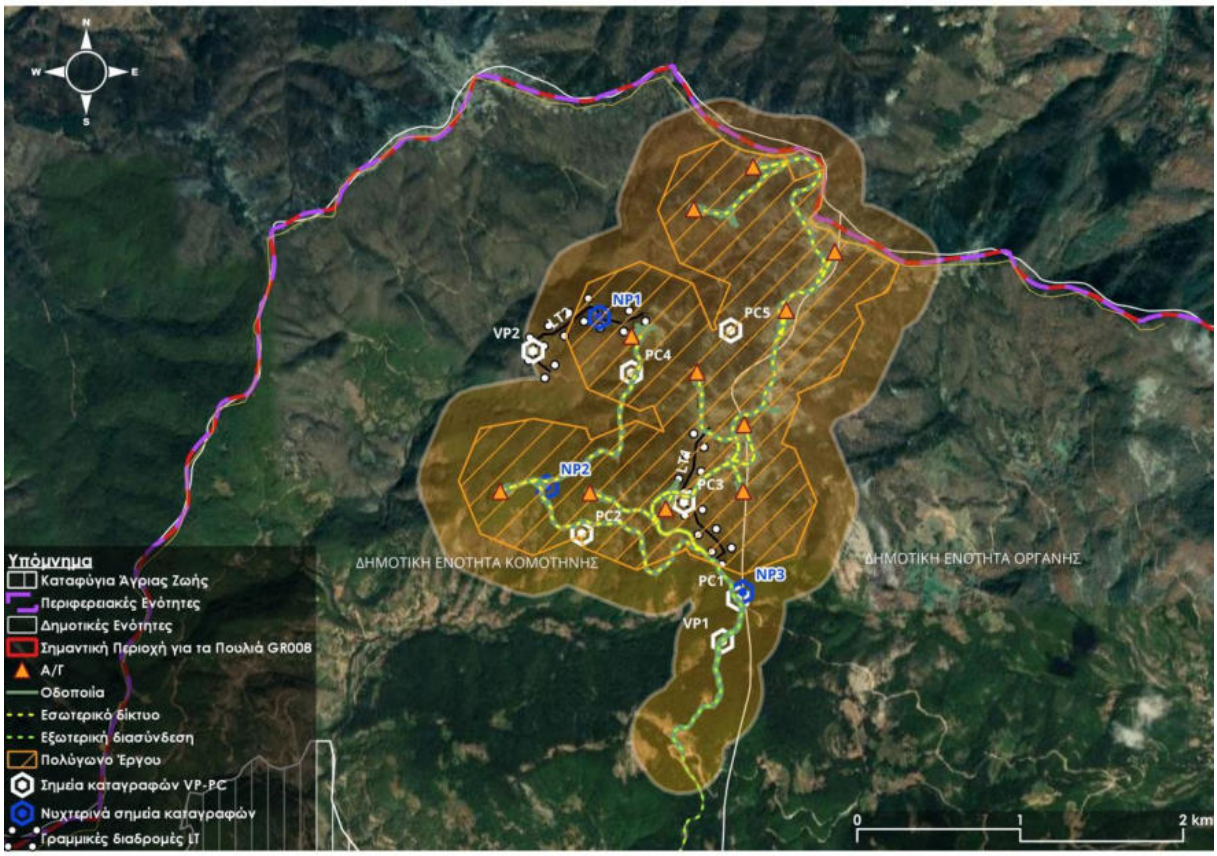


Figure 4.2-5 Map depicting the bird sighting and recording points around the perimeter of the project site.

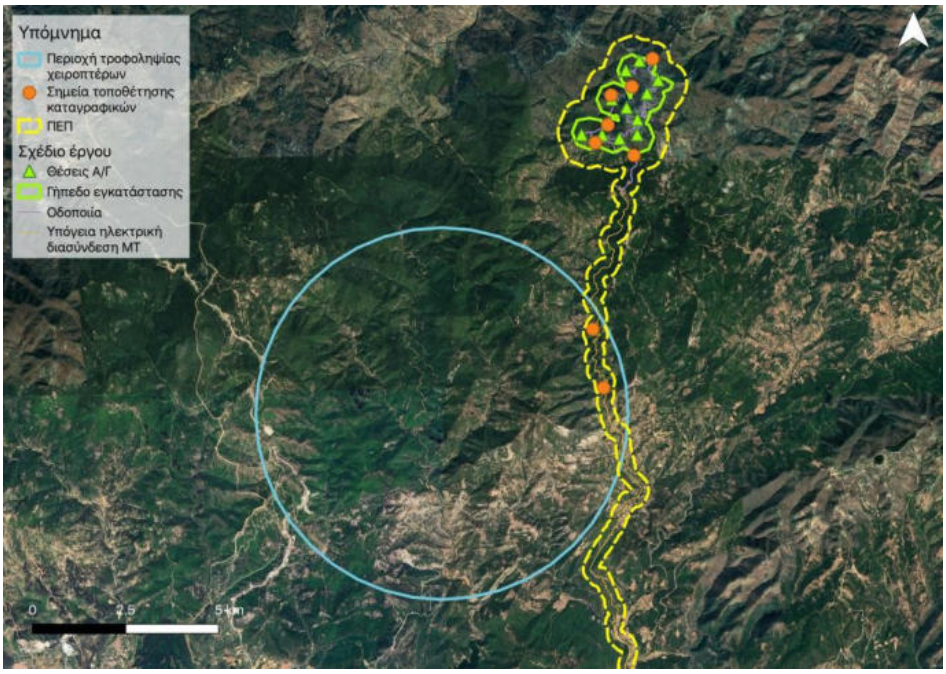


Figure 4.2-6 Map depicting the handrail recording points within the CIP.

4.2.3 Results

A total of 48 bird species were identified (Table 4.2-1), of which only 3 were large raptors, 2 small and 1 nocturnal. The Capercaillie (*Parus major*) and Finch (*Fringilla coelebs*) were in the top 2 positions in terms of abundance, with 68 individuals of both species. The **presence of raptors is considered very moderate** with the dominant species being the Hawk (*Buteo buteo*) which is estimated to occupy 2 territories within the polygon. **Vultures (*Gyps fulvus*) were seen passing through once in March** heading towards Bulgaria where they are known to nest heavily. **Snake Eagle (*Circaetus gallicus*) was observed only 2 times** in the south of the study area, one individual in March and one in June. Finally, White-tailed Godwit (*Accipiter nisus*) was also observed quite a lot in the area with a total of six individuals in 3 of the 4 months of observations. Oak Warblers (8 species) were strongly present, as the Beech/Oak habitat provides ideal nesting and foraging sites (see Appendix II for photos). In particular, Ash Woodpecker (*Picus canus*) is judged to have a particularly high population within the study area, in proportion to other nearby areas studied (personal observations). Also in June, several juveniles were observed on their first flights, such as Blue-winged Teal, Finches and Chaffinches.

Among mammals, the Roe Deer (*Capreolus capreolus*) was visually observed in many places, while traces of Wild Boar (*Sus scrofa*), Hare (*Lepus europaeus*) and Fox (*Vulpes vulpes*) were found.

Regarding nocturnal predators, only the Hoohoo (*Strix aluco*) was detected in all the places where the bioacoustic station was placed, however, it was not possible to photograph any mammal using the cameras.

Table 4.2-1 Species of avifauna recorded in the MPA by all methods during field visits

A/A	Scientific Name	Greek Name	Number of people*
1.	Finch	***fringilla coelebs***	68
2.	The Monk	***Parus major***	68
3.	Blackbird	***turdus merula***	63
4.	Kissa	***Garullus glandarius***	54
5.	Fassa	***Columba palumbus***	49
6.	Gerakotsichla	***Turdus viscivorus***	48
7.	Ducky	***Cyanistes caeruleus***	47
8.	Aegithalos	***Aegithalos caudatus***	40
9.	Gerakina	***Buteo buteo***	40
10.	Dendrochopanakos	***pitta europaea***	37
11.	Kokkinolaimi	***Erithacus rubecola***	34
12.	Cardarina	***Carduellis carduellis***	28
13.	Bee-eater	***Merops apiaster***	27
14.	Syringa	***Emberiza cirlus***	26
15.	Ascetic Woodpecker	***picus canus***	20
16.	Cambodian	***Certhia brachydactyla***	18
17.	Crow	***Corvus corax***	17
18.	Black Woodpecker	***Dryocopus martius***	17
19.	Ruffed Grouse	***Upupa epops***	17
20.	Dendrophylloxacos	***Phylloscopus collybita***	16
21.	Chestnut trap	***poecile palustris***	15
22.	Chewing gum	***Common Turd***	14
23.	Coconut Crusher	***Coccothraustes***	13
24.	Cinderella	***corvus corone***	13
25.	Trees	***Lullula arborea***	13
26.	Miltohelidon	***cecropis daurica***	12
27.	Cuckoo	***Cuculus canorus***	12
28.	Carbuncle	***Phoenicurus ochruros***	10
29.	Hoochie	***Strix aluco***	10
30.	Xefteri	***Accipiter nisus***	9
31.	Nanodigger	***Dendrocopos minor***	9
32.	Pinecodonculus	***Dendrocopos major***	8
33.	Eagle Eagle	***Lanius collurio***	8
34.	Nightingale	***Luscinia megarynchos***	8
35.	Sykophagos	***Oriolus oriolus***	7
36.	Woodpecker	***Troglodytes troglodytes***	7
37.	Brahokirkejo	***Falco tinnunculus***	6
38.	Bunotsirovacos	***Sylvia curuca***	6
39.	(European) Florus	***chloris chloris***	5
40.	Strawberry	***Emberiza hortulana***	5
41.	Middle Woodpecker	***Leiopicus medius***	5
42.	Mavroskoufis	***Sylvia atricapila***	5

43.	Oak woodpecker	***Ficedula semitorquata***	4
44.	Vulture	***Gyps fulvus***	4
45.	Green Woodpecker	***picus viridis***	4
46.	Lefkonius woodpecker	***Dendrocopos leucotos***	3
47.	Snake Eagle	***Circaetus gallicus***	2
48.	Balkan Woodpecker	***Dendrocopus suriacus***	1

A total of 8,789 sound sequences (recordings-indicator of species presence frequency), 60,644 calls (indicator of species presence duration in the area) were recorded and identified at the species level and 19 species of chironomids were identified. Most records per sampling occurred in the installation field with an average of 591 records per sampling and 8643 calls, while in the feeding area the records per sampling were about half (218 records and 4395 calls). In summary, the results from the sampling for the project are summarized in the table below.

Table 4.2-2 Types of hand grabs recorded in the CIP and foraging area and number of records and calls.

a/a	Taxa	Installation ground		Feeding area		Total	
		# log of	# call sign of	# log of	# call sign of	# log of	# call sign of
1	***Barbastella barbastellus***	32	135	4	36	36	170
2	***hypsugo savii***	9	187	0	0	9	187
3	***Miniopterus writer's site***	4	34	0	0	4	34
4	***Myotis alcathoe***	39	305	0	0	39	305
5	***Myotis capaccinii***	2	7	0	0	2	7
6	***Myotis daubentonii***	11	95	2	37	13	133
7	***Myotis myotis***	15	232	0	0	15	232
8	***Nyctalus lasiopterus***	157	357	0	0	157	357
9	***Nyctalus leisleri***	36	123	11	71	47	194
10	***Nyctalus noctula***	679	2332	4	49	683	2381
11	***Pipistrellus cowlick***	94	1715	13	281	107	1995
12	***Pipistrellus nathusii***	94	1092	0	0	94	1092
13	***Pipistrellus pipistrellus***	615	14072	398	8280	1014	22352
14	***Pipistrellus pygmaeus***	1644	30215	0	0	1644	30215
15	***Plecotus auritus***	43	445	4	36	47	481
16	***Plecotus kolombatovici***	24	211	0	0	24	211
17	***Rhinolophus euryale***	34	264	0	0	34	264
18	***Rhinolophus hipposideros***	7	24	0	0	7	24

19	***Vespertilio murine***	7	9	0	0	7	9
Council	**Items**	**19**		**7**		**19**	
	Recordings/Cal Creatures	**3546**	**51855**	**436**	**8789**	**3981**	**60644**
	Recordings/results by sampling	**591**	**8643**	**218**	**4395**	**1991**	**30322**

The following diagrams show the species composition per sampling area, i.e. at the installation site of the G/G and at the feeder area where the underground electricity interconnection passes through. It is observed that in the installation site the dominant species with 46% of the total number of records is the Micro Bat (*Pipistrellus pygmaeus*), with the co-dominant species being the Nanon Bat (*Pipistrellus pipistrellus*) with 17% and the Nocturnal Bat (*Nyctalus noctula*) with 19%. In the foraging area, the majority of the records recorded in the feeding area were of the Nun's Bat (*Pipistrellus pipistrellus*) with 91%.

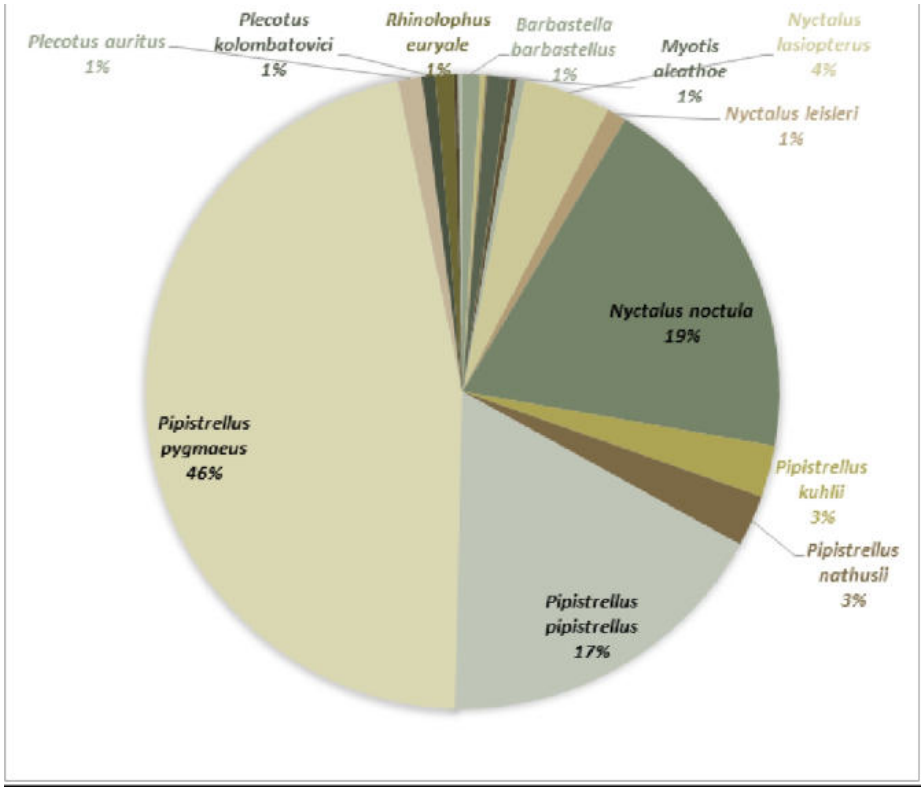


Figure 4.2-7 Percentage of recordings by species on the project site. Only species that make up a percentage of 1% or more are listed.

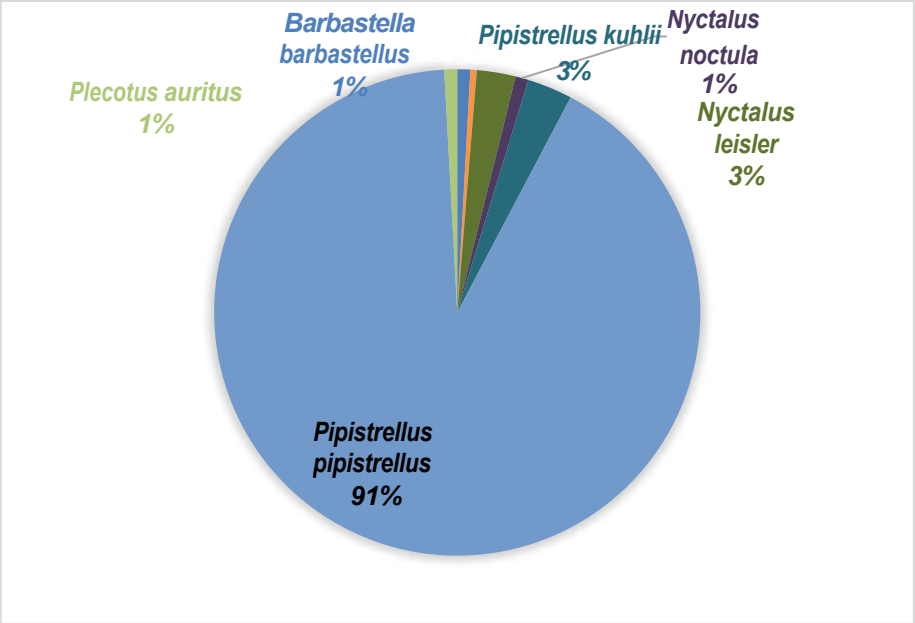


Figure 4.2-8 Percentage of records by species in the nearest known feeding area. Only species that make up 1% or more are listed.

Part of the accompanying works of the ASPEO at the "Warrior" site pass within a designated hand-feeding area. In particular, part of the underground MT electrical interconnection line crosses the eastern part of the feeder area delineated around the known chironomid colony in the cave "Supatzin - Ine" in Patterma, Rhodope (LIFE17 NAT/GR/000522 - LIFE GRECABAT, 2021-2023). In the maps the exact location of the refuge is missing for reasons of data sensitivity. The minimum distance of the cable undergrounding works from the reserve is more than 4 km, the road works more than 7 km and the nearest A/C more than 8 km.

The refuge is active during March-April (LIFE17 NAT/GR/000522 - LIFE GRECABAT, 2021-2023) and the estimated number of individuals is over 100 (Georgiakakis et al., 2021). The species that use it are *Miniopterus schreibersii, Rhinolophus ferrumequinum* and *Rhinolophus euryale* (LIFE17 NAT/GR/000522 - LIFE GRECABAT, 2021-2023). Of these species, only 4 records of *Miniopterus schreibersii*, 34 records of *Rhinolophus euryale* and no records of *Rhinolophus* ferrumequinum were recorded in the CIP. All records were noted on the installation site and not within the foraging area.

Commentary on results:

The results of the present study were obtained from a field survey conducted in the CIP at the end of October under good weather conditions, suitable for the investigation of the chironomid fauna. Although observations were made towards the end of the breeding season, the elevated temperatures for the season and good weather conditions in the area favored the sampling effort. Therefore, it is considered that the results are indicative of the species diversity and the intensity of handfisher activity in the area.

The project site is located in a forest area, in the eastern mountain range of Rodopi, northeast of Komotini, in the P.E. Rodopi, outside protected areas of the Natura 2000 network". **The forest habitats and the presence of fresh water make these areas suitable for foraging and sheltering of chironomids.**

According to the results of the sampling of the species and activity of the chironomids carried out, with 19 taxonomic units identified at the species level, **diversity is considered high**, however the most frequently recorded species **are not endangered**, and of those with a comparatively much lower number of records 1 species is Endangered and 3 are Vulnerable. **Activity is** also **considered high in the area of the installation of the A/Gs** (average 591 records per sampling) **and moderate in the feeder area where the underground interconnection cable passes through** (average 218 records per sampling). The **clearly higher chirp activity in the A/C installation area is mainly due to the significant presence of water**, which is an attraction for bats, as food is abundant in areas with water. In fact, the most prevalent species in the installation site were the Micro Bat and Nightjar, whose main habitat is forests near freshwater. These two species are fairly widespread in Greece, not in an endangered category according to the Greek Red Data Book and the IUCN Red Data List, with the conservation status of the Nightshade being inadequate at the national level.

Within the mapped foraging area, moderate chirping activity was recorded, and the majority of the records belonged to the Nanon Bat, a species with a wide distribution in Greece and a wide range of habitats, which is not in an endangered category according to the Greek Red Data Book and the IUCN Red Data List, but its conservation status is inadequate at the national level. In this foraging area, no species of chironomids of the known colony (*Miniopterus schreibersii, Rhinolophus ferrumequinum* and *Rhinolophus euryale*) were recorded in the cave
"Supajin - Ine". On the contrary, activity of *Miniopterus schreibersii* and *Rhinolophus euryale* was recorded in the area where the A/Cs were installed, although low. Given that the colony activity in the "Supajin - Ine" cave is confirmed only during the March-April period (LIFE17 NAT/GR/000522 - LIFE GRECABAT, 2021-2023), the above results are partly expected, as it is possible that during the period of the survey (October), these species may have moved to their winter refuges. However, the low intensity of activity of the three species in the project area (with the highest being *Rhinolophus euryale* with 34 records and 264 calls) suggest that the location of the winter refuge is far from the projects and that the WTP is located marginally within the foraging area.

4.2.4 Maps log of Habitat maps of species predators observed in the field

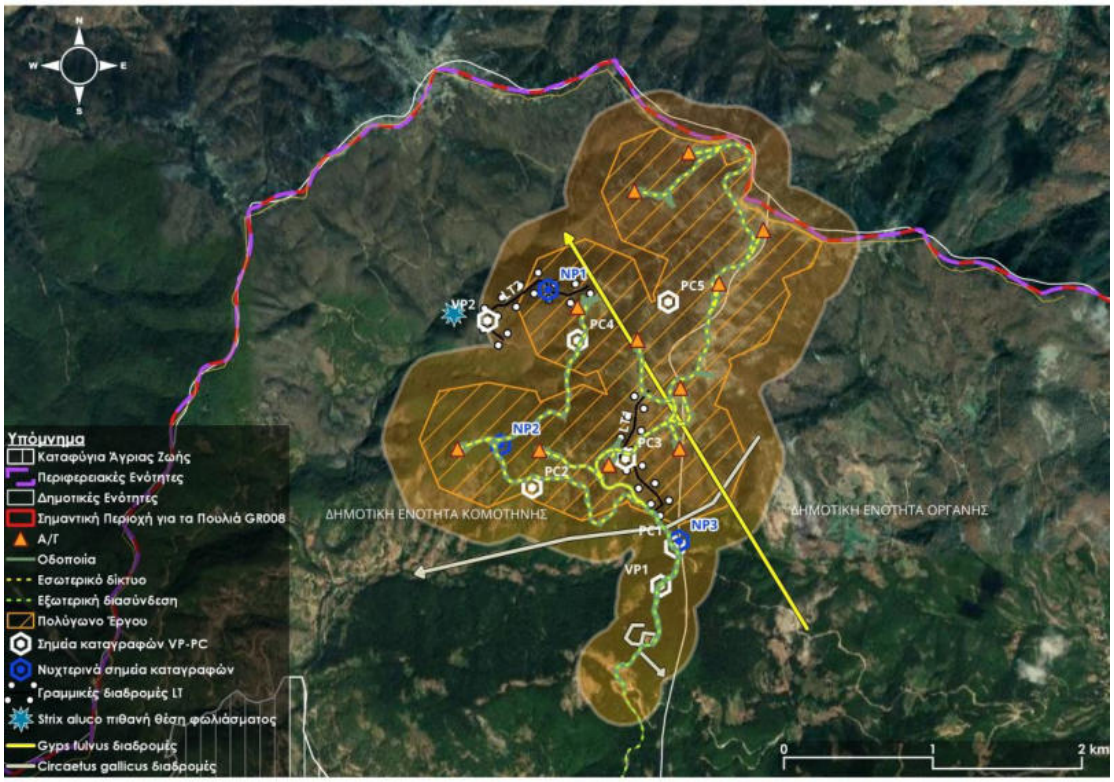


Figure 4.2-9 Spatial representation of observations of bird trackways of *Gyps fulvus* and *Circaetus gallicus* and possible nesting locations of the noctuid *Strix aluco* during fieldwork.

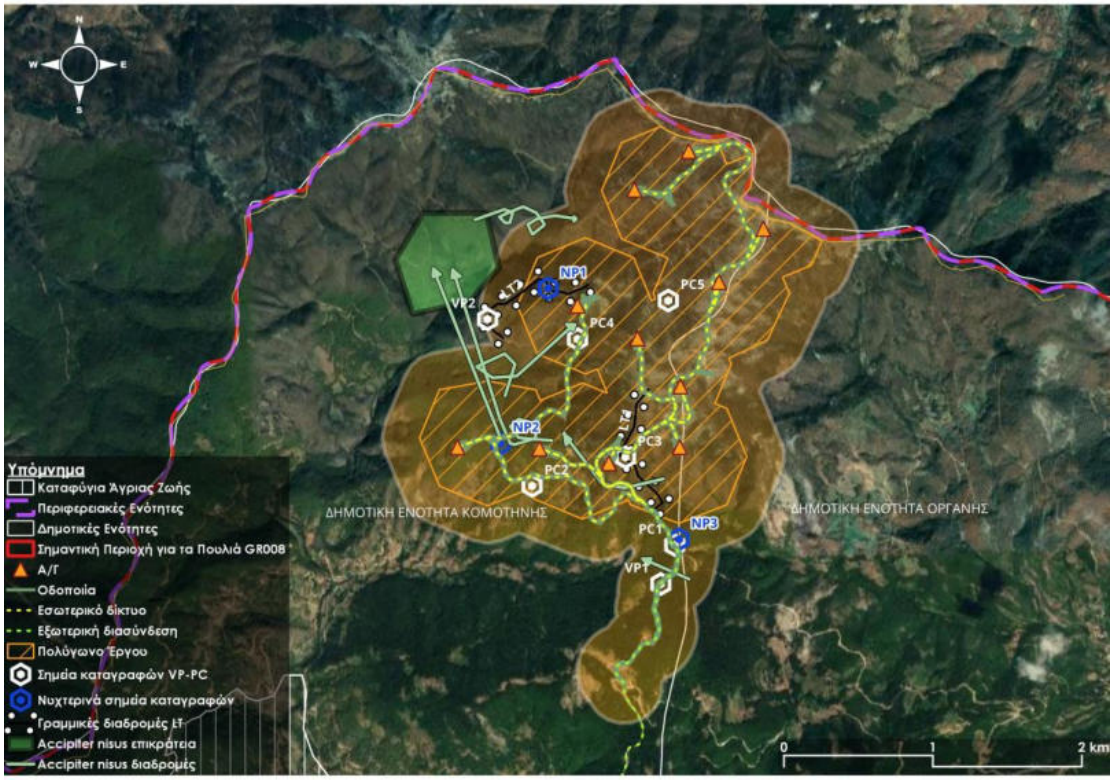


Figure 4.2-10 Spatial representation of the territory observations and pathways of *Accipiter nisus* during fieldwork.

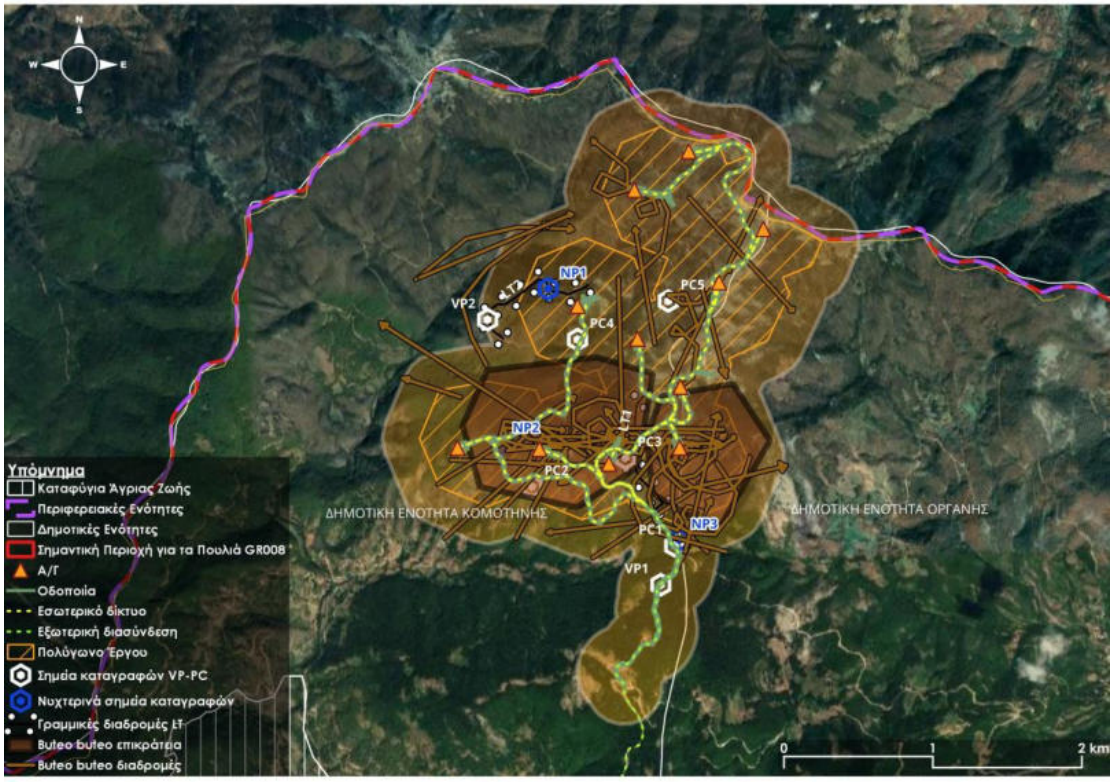


Figure 4.2-11 Spatial representation of the territory and pathway observations of *Buteo buteo* during fieldwork.

4.2.5 Status of protection of the species of avifauna of Annex I of the HPAI HH 37338/1807/E.103 (B' 1495) and other migratory species

Table 4.2-3 Protection status of the species recorded in the MPA and their presence in the wider Greece

Greek Name	Latin name	Status of Presence	IUCN	Greek Red Book	European Statute of Threats	Annex a to Directive 2009/147/EC	Berne Convention	The Bonn Agreement
(Common) Xefteri	***Accipiter nisus* all others**	WV, r			LC		II	II
Aegithalos	***Aegithalos caudatus***	R			LC		III	
(Common) Falcon	***Buteo buteo***	R, WV			LC		II	II
(Common) Catherine	***Carduelis carduelis***	R, wv			LC		II	
Miltohelidon	***cecropis daurica***	SV, pm			LC		II	
Cambodian	***Certhia brachydactyla dorotheae***	R			LC		II	
(European) Florus	***chloris chloris***	R, wv			LC		II	
Snake Eagle	***Circaetus gallicus***	cv, pm		NT	LC	I	II	II
(European) Cockroach	***Coccothrauste s coccothrauste s***	WV, r			LC		II	
(Common) Tuna	***Columba palumbus palumbus***	R			LC	II/1; III/1		
(Common) Crow	***Corvus corax***	R			LC		III	
(Ash) Curunya	***Corvus corone cornix***	R			LC	II/2		
(European) Cuckoo	***Cuculus canorus***	sv, PM			LC		III	
Ducky	***Cyanistes caeruleus s. str.***	R			LC		II	
Lefkonotis woodpecker	***Dendrocopos leucotos***	r		NT	LC	I	II	
Pinecoducter	***Dendrocopos major all others***	r			LC		II	
Nanodendrocolopers	***Dendrocopos minor***	r			LC		II	
Balkan Woodpecker	***Dendrocopos syriacus***	R			LC	I	II	
Black Woodpecker	***Dryocopus martius***	r			LC	I	II	

Syringa	***Emberiza cirlus***	R			LC		II	
Strawberry	***Emberiza hortulana***	SV			LC	I	III	
Kokkinolaimi	***Erithacus rubecula***	WV, R			LC		II	II
Brahokirkejo	***Falco tinnunculus***	R			LC		I	II
Oak woodpecker	***Ficedula semitorquata***	sv, pm	NT	DD	LC	I	II	II
(Common) Finch	***Fringilla coelebs all others***	R, WV			LC		III	
(European) Kissa	***Garrulus glandarius***	R			LC	II/2		
Vulture	***Gyps fulvus***	R		VU/CR	LC	I	II	II
Eagle Eagle	***Lanius collurio***	SV, pm			LC	I	II	
Middle Woodpecker	***Leiopicus medius***	R			LC	I	II	
Treestar	***Lullula arborea***	R			LC	I	III	
(Common) Nightingale	***Luscinia megarhyncho s***	SV			LC		II	II
(European) Bee-eater	***Merops apiaster***	SV, PM			LC		II	II
(European) Syphagus	***Oriolus oriolus***	SV, PM			LC		II	
The Monk	***Parus major***	R			LC		II	
Carbuncle	***Phoenicurus ochruros***	WV, R			LC		II	II
Arborvitae	***Phylloscopus collybita s. str.***	WV, SV			LC		II	II
Ascetic Woodpecker	***picus canus***	r		NT	LC	I	II	
Green Woodpecker	***Picus viridis s. str.***	r			LC		II	
Dentrotsopanakos	***pitta europaea***	R			LC		II	
(Common) Humphurist	***Strix aluco***	R			LC		II	
Mavroskoufis	***Sylvia atricapilla***	R, WV			LC		II	II
Bunotsirovacos	***Sylvia curruca***	SV, PM			LC		II	II
(European) Woodpecker	***Troglodytes troglodytes all others***	R			LC		II	
(Common) Blackbird	***turdus merula***	R, WV			LC	II/2	III	II

(Common) Chewing gum	***Common Turd***	WV, r			LC	II/2	III	II
Gerakotsichla	***Turdus viscivorus***	R, WV			LC	II/2	III	II
Ruffed Grouse	***Upupa epops***	SV, PM			LC		II	

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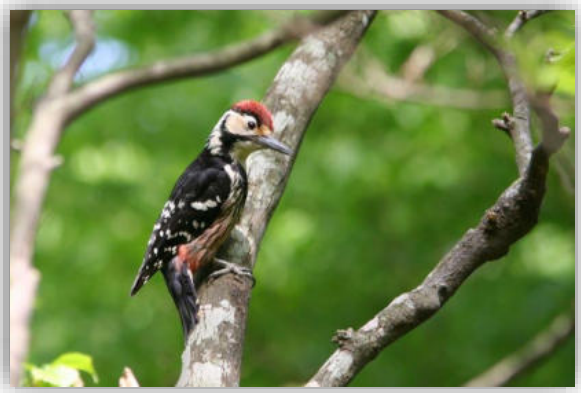
Status of Presence

R: Resident (epidemic)
SV: Summer visitor - Reproduced
PM: Passing visitor
PLM: Partially migratory species **NBV:**
Non-breeding visitor **WV:** Winter visitor
Acc: Random or rare visitor
Ext: Eclipse
FBr: Imported
(**NB:** for all the above: capital letters indicate that the species is common, small letters indicate that it is rare)
IUCN: Threat categories according to the IUCN/IUCN Red List of Threatened Species
CR=Critically Resistant
EN=Vulnerable
VU=Vulnerable
NT=Larely Threatened LC=Low
Concern DD=Depressedly
Deteriorated NE=Not assessed
Hellenic Red Book of the endangered vertebrates of Greece (Hellenic Zoological Society, A. Legakis, P. Marangou, 2009).
EX=Ecliponda
EW=Extracted from their natural environment
CR= Critically Endangered
EN=Vulnerable
VU=Vulnerable
NT=Larely threatened LC=Low
concern DD=Dependently
known NE=Not assessed.
SPEC: Species of European Conservation Concern (**SPEC:** Species of European Conservation Concern), the conservation category in which species are classified according to the publication "Birds in the European Union: a status assessment" by BirdLife International (BirdLife International, 2004).
1 = Species whose populations are considered to be of Global Conservation Interest, i.e. Globally Threatened, Near Threatened, or Not Well Known according to the IUCN Red List of Threatened Species
2 = Species whose populations are in an undesirable conservation status at European level and are concentrated in Europe
3 = Species whose populations are in an undesirable conservation status at European level although not concentrated in Europe
-E = Species whose populations are in a desirable conservation status in but are concentrated in Europe
- = Species whose populations are in a favourable conservation status and are not concentrated in Europe When SPEC is followed by the symbol (^{W}) it refers to wintering populations.
Threat status in the EU according to a publication of BirdLife International (2004).
CR= Critically Endangered
EN= Endangered
VU= Vulnerable
NT= Near Threatened
D= Reduced
R= Rare
H= Exhausted
L= Local
DD= Not sufficiently known
S= Fixed
NE= Not assessed (found in the area only during migration)
( ) = Provisional status.
Directive 2009/147/EC: on the conservation of wild birds:
I: Species subject to specific management measures relating to their habitat
II/1: Species authorised to be hunted in the geographical area to which the Directive applies
II/2: Species which may be hunted only in the Member State indicated
III/1: Member States shall not prohibit the exploitation of these species

III/2: Member States may prohibit the exploitation of these species
Bern Convention: The species included in the Appendices of the International Convention on the Conservation of European Wildlife and Natural Environment, as ratified by Law 1335/83.
Annex II: Species of fauna under strict protection
Annex III: Species of fauna under protection
Bonn Convention: Symbolizing the species included in Appendices I and II of the International Convention on the Conservation of Migratory Species of Wild Animals
Annex I: Endangered migratory species (Article 3(1))
Annex II: Endemic species whose conservation status is unfavourable and for which International Agreements are needed for their conservation and management, and those whose conservation status would benefit significantly from the international cooperation that would result from an International Agreement
b: Central European populations only
c: Only populations of NW Africa
d: Asian populations only
e: *Porzana parva* only
f: Only populations of Africa and South West Asia

4.2.6 Record the main characteristics of all additional Annex I species of avifauna of Directive 2009/147/EEC observed in the field



***Dendrocopos leucotos* - Leucotos woodpecker**

Ecological requirements - Distribution: The species has a sparse distribution in mainland Greece, usually observed in the mountainous areas of the country with the southernmost limit of its distribution being in Taygetos. A μικρός population breeds in the northernmost part of the mountain range. in Kefalonia (Handrinos & Akriotis, 1997). The degree of isolation of populationsof Peloponnese and Kefalonia is high.

The species nests in cavities that it itself opens in dead trunks, mainly of deciduous trees. The height of the nest varies from 1,4 to 6,4 m above the ground (in some cases even higher). Usually a new cavity is opened each year for nesting (Cramp, 1998). The selection of suitable nesting sites is related to the abundance of dead logs in the forest (Roberge et al, 2008; Gjerde et al, 2005). Areas with a high density of dead logs (e.g. 17 logs/ha) are preferred to sites with a lower density (Czeszczewik & Walankiewicz, 2006). Also, the quality of dead logs is related to the presence of the species as areas with tall and thick as opposed to low and thin dead logs are used (Garmendia et al., 2006). The area of the territory during breeding is about 19 hectares and is significantly larger in winter (Fernandez & Azkona, 1996). Pure and mature beech forests, mixed beech-fir or beech-pine forests, are the optimal habitat for the species (Handrinos & Akriotis, 1997; Garmendia et al, 2006; Roberge et al, 2008).

The species feeds on insects, mainly larvae of wood-eating insects (Coleoptera), throughout the year. Outside the breeding season it supplements its diet with fruits e.g. hazelnuts (Cramp, 1998). It obtains most of its food from dead logs at an advanced stage of decay. Dead logs are a rich habitat with a wide variety of wood-eating insects, so their availability in the forest largely regulates the survival rate of

Leuconotis woodpecker (Aulen & Lundberg 1991). Log quality also influences the choice of foraging site, as large-sized logs are preferred over smaller-sized logs. During the breeding season the species feeds in close proximity to the nest. This leads to the selection of sites with a high abundance of insects, such as dead log assemblages (Garmendia et al, 2006). At the spatial landscape level, mature forests with a high proportion of deciduous forest species e.g. beech, which are rich in dead wood mass, are preferred (Carlson, 2000; Gjerde et al, 2005).

Threats: The White-crowned Woodpecker prefers mature forests of mostly deciduous woodland or mixed deciduous and coniferous forests. The availability of dead standing trees for pollination as well as the total dead mass in the forest is an important parameter for both the survival of the species and the location of its territories. At the spatial level of the territory, preference is given to areas with clusters of dead standing trees that are rich in food resources (wood-eating insects) while at the same time presenting available sites for nesting.

***Dryocopus martius* - Black woodpecker**

Ecological requirements - Distribution: The Black Woodpecker is observed at higher altitudes in forests of northern and central Greece, in low populations. It also breeds in Kefalonia, where it is the only island population of the species in the Mediterranean (Handrinos & Akriotis 1997).

The species nests in cavities in vertical trunks of old trees or in dead webbed trunks in both deciduous and coniferous forest species (Cramp 1998). The selection of suitable nesting sites is related to the presence of mature trees and the presence of dead standing logs (Garmendia et al. 2006; Fernandez & Azkona 1996). It also selects nesting sites where mature forest alternates with openings or gaps in the forest (e.g., from landslides) or grasslands where food availability is high (Garmendia et al. 2006). The above forest mosaic seems to be an essential building block of the species' territories (Tucker & Heath 1994; Fernandez & Azkona 1996).

The species feeds mainly on ants, particularly of the genera Lasius and Formica, but also on larvae of wood-eating insects throughout the year (Cramp 1998). Most of their food is obtained from the soil and secondarily from dead logs in an advanced stage of decay. Their 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 (Garmendia et al. 2006).

Threats: The main threats to the species are related to the degradation/loss of critical habitat, particularly nesting habitat. Thus, the intensification of forestry with the logging of mature forest stands and the extraction of dead standing trees threaten the species at the spatial level of the territory (Garmendia et al., 2006? Tucker & Heath, 1994; Fernandez & Azkona, 1996). In addition, the gradual afforestation (e.g. artificial reforestation of coniferous deciduous forests) of forest niches affects

negatively affecting the foraging habitat of the species, reducing forest heterogeneity (Garmendia et al, 2006).

***Emberiza hortulana* - Stilt**

Ecological requirements - Distribution: The species has a wide distribution throughout mainland Greece, while in the Ionian and Aegean islands it breeds only in Crete and possibly in Samothrace (Handrinos, & Akriotis, 1997).

The species builds its nest on the ground in places with vegetation cover (Cramp, 1998).

It nests on the borders of crops or meadows, where there is natural vegetation (plant fences) or in bushes. It has also been observed to nest in gaps or natural openings and in forest patches with agricultural or grassland areas (Handrinos, & Akriotis, 1997). The species prefers areas with high heterogeneity of vegetation at ground level (Vepsalainen et al. 2005), where sites with bare ground or sparse vegetation are mixed with sites of taller vegetation e.g. shrubs or trees (Berg, 2008). The availability of nesting, singing and foraging sites accounts for the above selection (Golawski & Dombrowski, 2002;). Population density is higher in extensive croplands (including those under fallow) and in grasslands in the presence of shrubs (Berg, 2008). In contrast, the species is absent from areas at an advanced stage of vegetation succession (e.g. forested grasslands) (Sirami et al. 2007). Bladderwrack benefits from small-scale fires that create openings and open spaces in areas of dense vegetation (Dale & Olsen 2002; Pons & Bas, 2005) and colonises them in a short period of time (Pons & Prodon 1996). A typical example is the spread of the species in Catalonia, Spain, which is largely attributed to fires (Brotons et al., 2008).

The Bladderwrack feeds on seeds (mainly cereals or grasses) and in the breeding season on invertebrates. It collects its food mainly on the ground and often in close proximity to shrubs or trees that provide cover (Cramp, 1998). Rural landscapes or pastures with high heterogeneity, where crops or meadows are mixed with islands of forest, hedgerows and scattered shrubs are the optimal habitat for the species, (Fonderflick et al, 2005; Sirami et al. 2007; Brotons et al, 2008). The above selection is related to the availability of suitable singing sites, the supply of cover from predators and the availability of food resources (Vepsalainen et al. 2005; Berg, 2008). The species also prefers grasslands, pastures or areas under fallow in the presence of scattered shrubs as the availability of insects and invertebrates in these areas is high due to the limited use of agrochemicals and non-intensive use (Berg, 2008). Mild grazing and small-scale fires have a positive effect on foraging habitat by providing the necessary vegetation heterogeneity at the ground level. (Pons & Prodon 1996; Dale & Olsen 2002; Brotons et al, 2008).

Threats: Habitat loss due to agricultural intensification and homogenization of rural landscapes is a major threat to the species (Fonderflick et al., 2005; Vepsalainen et al. 2005). Alteration of natural hedgerows, shrubs and logging of forest islands in rural areas and grasslands are agricultural practices that threaten the species (Berg, 2008). A serious threat to the species, especially in mountainous a r e a s , is the long-term abandonment of crops (mainly

cereals) and the gradual decline of traditional livestock farming processes that are accelerating the gradual conversion of open land into forests. Finally, residential development may be a factor in reducing populations of the species at local scales (Tucker & Heath, 1994).

***Falco tinnunculus* - Rock Turtle**

The Brahokirkinenzo is the most common predator in Greece. It is found throughout mainland Greece and most of the Ionian and Aegean islands and Crete.

It always nests on vertical rocks maintaining individual territories although groups of 2-10 pairs have been observed nesting together in the same rock formation or canyon. It also nests in buildings and quarries (Cramp & Simmons 1980, Tucker & Heath 1994).

with low vegetation and bare ground as well as meadows. It feeds on small mammals, reptiles and insects (Vlachos et al. 2003, Ursha et al. 2005, Gensbol & Thiede 2008). Crows are considered to be predators of eggs and chicks of the Rockhopper.

Threats: Agricultural intensification and industrialization combined with extensive pesticide use threaten the species (Newton 1979; Village 1990; Tucker & Heath 1994). Also, abandonment of traditional farming and ranching practices and afforestation of grasslands result in loss or degradation of hunting habitat (Sanchez-Zapata et al. 2003).

***Lullula arborea* - Treestar**

Ecological requirements - Distribution: The tree starling is a small strut-like ground bird belonging to the lark family. It is smaller than the Wheatear, has a short tail, white ocular stripes up to white. the to the nape of the neck, rounded crest and slender beak. Its plumage is yellow-brown (earthy) with brownish-black spots on the upper part, the belly whitish-cream and the chest with strong brown streaks. The differences between the two sexes are negligible, differing only in size.

It lays 2 or even 3 times a year, from 3 to 5 eggs and the nest is made in the ground. Incubation lasts from 12 to 15 days. It is a migratory bird. It prefers to perch in trees, at the edge of the forest, on hillsides with large trees. It feeds on various seeds, forest fruits, cereals, insects and worms.

***Picus canus* - Ashy woodpecker**

Ecological requirements - Distribution: Cinder Woodpecker has been recorded in a small number of areas mainly in northern and central Greece. Its populations seem to have a high degree of isolation (Handrinos & Akriotis, 1997).

The species nests in cavities in vertical trunks old trees trees ή in dead webbed trunks in both deciduous and coniferous forest species (Cramp, 1998). The selection of suitable nest sites is related to the presence of mature trees and the presence of dead webbed trunks (Garmendia et al., 2006; Fernandez & Azkona, 1996). It also selects nesting sites where mature forest alternates with openings or gaps in the forest (e.g. from landslides) or grasslands where food availability is high (Garmendia et al., 2006). The above forest mosaic appears to be an essential building block of the species' territories (Tucker & Heath, 1994; Fernandez & Azkona, 1996).

The species feeds mainly on ants, especially of the genera Lasius and Formica, but also on larvae of wood-eating insects throughout the year. (Cramp, 1998). They obtain most of their food from the soil and secondarily from dead logs in an advanced stage of decay. Their foraging habitat is characterized by high structural heterogeneity as sites with mature forest and tall trees alternate with open areas, meadows or forest gaps where they are rich in ant colonies (Garmendia et al., 2006).

Threats: The main threats to the species are related to degradation/loss of critical habitat, particularly nesting habitat. Thus, the intensification of forestry with the logging of mature forest stands and the extraction of dead standing trees threaten the species at the spatial level of the territory (Garmendia et al, 2006; Tucker & Heath, 1994; Fernandez & In addition, gradual afforestation (e.g. artificial reforestation of coniferous deciduous forests) of forest niches negatively affects the foraging habitat of the species, reducing forest heterogeneity (Garmendia et al 2006).

4.2.7 Protection status of the handicap species recorded in the CIP

In total, 19 species of Handcreepers were identified in the ASPEO area. 5 of the 19 species recorded belong to a risk category of the Greek Red List and/or the European Red List (IUCN). For 12 species the conservation status at national level is inadequate (U1) and for 4 species it is satisfactory (FV). All species belong to Annexes IV and/or II of Directive 92/43/EEC. Finally, 9 of the species fly at high altitude and are therefore at increased risk of collision with A/C (EU, 2010). Table 3 lists the conservation and protection status of the species of chironomids recorded in the CIP.

The predominant species in the area, the *Pipistrellus pygmaeus*, is a species listed in Annexes II and IV of Directive 92/43/EEC and its conservation status is

is inadequate (U1) at national level and of Minimal Concern (LC) according to IUCN. It is a species mainly of lowland and riparian forests. It is quite agile in flight and is seen over water surfaces or around small clearings. It feeds mainly on midges, larvae and pubescent larvae (UNEP/EUROBATS).

The co-occurring species *Pipistrellus pipistrellus* is a species of Annex IV of Directive 92/43/EEC and its conservation status is nationally satisfactory (FV) and of Reduced Concern (LC) according to IUCN. It forages in a wide range of habitats, including open forests, wetlands, agricultural land, semi-arid and urban areas. It takes refuge in cracks in buildings and tree hollows and usually overwinters in underground spaces. Usually, during its movements between summer and winter residences, it does not travel long distances, but often at a distance of about 20 km. However, long-distance migrations have also been recorded (UNEP/EUROBATS).

The Nightshade is a significant presence in the MPA, it is a species of Annex IV of Directive 92/43/EEC and its conservation status is inadequate (U1) at national level and of Reduced Concern (LC) according to IUCN. It is mainly found in forests, although it can be found in urban areas in the presence of food and water. During the summer season, the Nightjar is found in tree holes (e.g. from woodpeckers) along the forest edges. In winter, they often take refuge in crevices in rocks, buildings and bridges. The species is characterized by fast and direct flight, often over tree foliage. The Nightjar is a typical migratory species. Populations from northeastern Europe are known to migrate southwest in autumn, covering distances of up to 1,000km (UNEP/EUROBATS).

Table 4.2-4 List of chironomid species recorded in the field survey area, protection status and conservation status according to 92/43, risk status in Greece and Europe.

a/a	Kind of	Common name	Annex to Directive 92/43 EEC	Conservation status	IUCN	Greek Red Book	Risk of anchorage
1	*Barbastella barbastellus*	Barbastellos	II, IV	U1	NT	EN	M
2	*hypsugo savii*	Mountain Bat	IV	FV	LC	LC	H
3	*Miniopterus writer's site*	Winged bat	II, IV	U1x	NT	NT	M
4	*Myotis alcathoe*	Myocyte of Alcathol	IV-HTL	XX	DD	DD	M
5	*Myotis capaccinii*	Footprint	II, IV	U1	VU	NT	L
6	*myotis daubentonii*	Myocyte of Daubenton	IV-HTL	XX	LC	VU	L
7	*Myotis myotis*	Tranomyotida	II, IV	U1x	LC	NT	L
8	*Nyctalus lasiopterus*	Big Nightshade	IV-HTL	U1	NT	VU	M
9	*Nyctalus leisleri*	Micronaut	IV-HTL	U1x	LC	LC	H
10	*Nyctalus noctula*	Nightshade	IV	U1	LC	DD	H
11	*Pipistrellus cowlick*	White bat	IV-HTL	FV	LC	LC	H
12	*Pipistrellus nathusi*	Bat of the Nathusius	IV	U1	LC	DD	H

13	*Pipistrellus pipistrellus*	Nanobat	IV-HTL	FV	LC	DD	H
14	*Pipistrellus pygmaeus*	Micro Bat	IV	U1x	LC	DD	H
15	*Plecotus auritus*	Brown bat	IV-HTL	U1	LC	VU	L
16	*Plecotus kolombatovici*	Mediterranean oton bat	IV-HTL	XX	LC	DD	L
17	*Rhinolophus euryale*	Mesorhinolophus	II, IV	U1x	NT	NT	L
18	*Rhinolophus hipposideros*	Micronova	II	FV	LC	LC	L
19	*vespertilio murinus*	Parallax Bat	IV-HTL	U1	LC	DD	H

(Conservation status FV=Satisfactory U1=Unsatisfactory X=Unknown/ Red Data Book Characteristics DD=Deficiently known LC=Low Concern NT= Near Threatened VU=Vulnerable/ Risk of collision H=High , M=Medium , L=Low).

As can be seen from the above table, 4 species belonging to the Greek Red Book's risk categories are *Barbastella barbastellus*, *Myotis daubentonii*, *Nyctalus lasiopterus* and *Plecotus auritus*. According to the IUCN, one species, *Myotis capaccinii* is Vulnerable Internationally (but not in Greece), with negligible presence in the MPA (only 7 call detections out of a total of 60,644 i.e. 0.01% or 2 records out of a total of 3,981 i.e. only 0.05% of the total).

Table 4.2-5 Percentages of species recorded in the MPA belonging to the risk categories of the Hellenic Red Data Book.

a/a	Kind of	Recordings	% of all records	Cables	% of all calls
1	*Barbastella barbastellus*	36	0,90%	170	0,28%
2	*myotis daubentonii*	13	0,33%	133	0,22%
3	*Nyctalus lasiopterus*	157	3,94%	357	0,59%
4	*Plecotus auritus*	47	1,18%	481	0,79%

4.3 Inventory of the state of the natural environment in GR008

4.3.1 Objectives and conservation status of GR008 and trends in the development of the area without the project

In addition to the assessment of the conservation status and favourable reference values of the nationally designated species, the assessment of the conservation status and trend of the nationally designated bird species of the SPF description form will be presented, according to the data from the consultation phase of the Surveillance (MPAPEN, 2015). In particular, the **Conservation Status of Distribution, Conservation Status** of **Population, Overall Conservation Status and Short- and Long-term trends in these parameters** will be reported**, a s** assessed for all breeding bird species at the national level, as breeding is one of the most important biological processes.

Table 4.3-1 Breeding Population Trend and Range Extent of the breeding population of the breeding population of the Bird Species characterising SPA GR008 at **national level**

Kind of	Population trend 2007-2018	Population trend 1980-2018	Spreading area trend 2007-2018	Spreading area trend 1980-2019
Aegypius monachus	+	+	=	+
Aquila chrysaetos	-	-	F	-
aquila heliaca	=	x	x	=
Ciconia nigra	+	x	x	+
Circaetus gallicus	+	+	x	+
clanga pomarina	=	-	x	=
Coracia garrulus	+	-	x	+
Dendrocopos syriacus	+	=	x	+
Brown Falco	=	+	x	=
Ficedula semitorquata	x	x	x	x
Gyps fulvus	+	=	-	+
Hieraetus pennatus	+	-	x	+
Lanius collurio	-	-	x	-
Leiopicus medius	=	=	x	=
Neophron percnopterus	-	-	-	-
Strix aluco	=	+	x	=
Sylvia crassirostris	=	=	x	=

Source: h t t p s : //nature-art12.eionet.europa.eu/article12/report?period=3&country=GR, 2023

SUBMISSION

+	Increme
=	ntal
	Stable
	x
-	
F	Unknow
	n
	Downwa
	rd
	Floating

The trends in species population values at the national level, according to the above tables, are inextricably linked to each species and the intensity of the pressures it is under. If the pressures intensify and increase, a deterioration in their conservation status is expected and the wider ecosystem will therefore be characterised by a negative trend. If these

pressures and threats are reduced or definitively addressed, then a positive trend for these important bird species is likely to emerge.

4.3.2 Desirable Reference Values (FRVs) for the study area

Regarding the desired reference values (Reference Range-FRR, Reference Area-FRA and Reference Population-FRP), the assessment provided in the Reference Forms of Article 17 of Directive 2009/147/EC for each species of Community Interest in Greece for the period 2013-2018 (EIONET, 2023) is used:

Table 4.3-2 Favourable Population and Range Reference Values for the bird species listed in the GR008 CP reference form at national level

Kind of	Epoch	EDF Area	ETA Habitat	ETA Population	Population unit
Aegypius monachus	B	5000		50	p
Aquila chrysaetos	B	50000		150	p
aquila heliaca	B	5000		5	p
aquila heliaca	W	55000	450		
Ciconia nigra	B	45000		80	p
Circaetus gallicus	B	164000		300	p
clanga pomarina	B	50000		90	p
Coracia garrulus	B	140000		400	p
Dendrocopos medius	B	96500		10000	p
Dendrocopos syriacus	B	61000		10000	p
Brown Falco	P	27000	7000		
Brown Falco	B	60000		6800	p
Falco vespertinus	P	69000	7200		
Ficedula semitorquata	B	46000		1000	p
Gyps fulvus	B	135000		300	p
Hieraaetus pennatus (Aquila	B	45000		100	p
Lanius collurio	B	115000		10000	p
Neophron percnopterus	B	20000		100	p
Phylloscopus bonelli	B	42500		10000	p
Strix aluco	B	122000		10000	p
Sylvia (hortensis) crassirostris	B	187000		5000	p

4.3.3 Ecological functions

The ecological functions of bird and fauna species of Directives 2009/147/EEC and 92/43/EEC, from the data analysed above, exist and unfold, providing the habitat with a stable ecological status. Their dynamics depend on whether the pressures and threats to the site will continue in the future and at what rate they will take place. An intensification of pressures, mainly of anthropogenic origin, could affect the coherence of some habitats and the conservation status of certain species, which would lead to an overall disturbance of the area, since the individual ecosystems that make up the area interact with each other and the impact on one of them may affect the overall ecological balance.

5 DUE ASSESSMENT AND EVALUATION OF THE IMPACT

5.1 Bird species

This section considers the potential significant effects that the project may cause on the structure and functions of the study area and the integrity of the area, especially with regard to Annex I species of Annex I avifauna of Directive 2009/147/EC. As the most important bird species for SPA GR008 'PHILYURI SOCIETY AND EAST RODOPI' the characteristic species of the area belonging to Annex I of Directive 2009/147/EC are assessed first, followed by the species identified in the field survey and also belonging to Annex I of Directive 2009/147/EC.
The species in the descriptor form for this SPA, which are categorised in relation to the European **Vulnerable Species** Status (**VU),** are ***Coracias garrulus, Falco naumanni*** and ***Gyps fulvus.*** Those categorised as Endangered **(EN)** are ***Aegypius*** monachus**,** ***Aquila chrysaetos, Ciconia nigra, Clanga pomarina, Hieraaetus pennatus*** and those categorised as Critically Endangered (**CR**) are ***Aquila heliaca*** and ***Neophron percnopterus.*** The species included in Annex I are the following: ***Aegypius*** *monachus***,** ***Aquila chrysaetos, Aquila heliaca, Ciconia nigra, Circaetus gallicus, Circus macrourus, Clanga pomarina, Coracias garrulus, Dendrocopos syriacus, Falco naumanni, Falco vespertinus, Ficedula semitorquata, Gyps fulvus, Hieraaetus pennatus, Lanius collurio, Leiopicus medius*** *and* ***Neophron percnopterus.***
In addition, 12 Annex I species, ***Circaetus gallicus, Dendrocopos leucotos, Dendrocopos syriacus, Dryocopus martius, Emberiza hortulana, Falco tinnunculus, Ficedula semitorquata, Gyps fulvus, Lanius collurio, Leiopicus medius, Lullula arborea*** and ***Picus canus were*** observed during the field visit. Of these, five belong to the species already described in the SPC description form, ***Dendrocopos leucotos, Dendrocopos syriacus, Lanius collurio, Leiopicus medius*** and ***Picus canus.*** Thus, of the species observed, only ***Gyps fulvus*** belongs to the Greek Red Data Book and of the three other raptors only ***Circaetus gallicus*** belongs to Appendix I. In the following, the potential impacts of the project on the avifauna and their significance are assessed in more detail.

Regarding the Vulture (*Gyps fulvus*), a mapping has been carried out by the Hellenic Ornithological Society for the sensitivity of critical areas for the species in our country (**Error! Reference source not found.**).
For the production of the map, data from LIFE-IP 4 NATURA (LIFE16 IPE/GR/000002) "*Integrated actions for the conservation and management of Natura 2000 sites, species, habitats and ecosystems in Greece - National Action Plan for three scavenging bird species (vultures)*" were used: *Vulture (Gypaetus barbatus), Vulture (Gyps fulvus), Black Vulture (Aegypius monachus*)", telemetry data provided specifically for this work by the Bulgarian organizations, the University of Crete/ Museum of Natural History of Crete (MFIK) and the results of a recent work on the identification of the habitat of vultures in the Balkans (Peshev et al. 2021 - **Error! Reference source not found.**).
The map shows 4 sensitivity zones:

- **Sensitivity Zone A (Red) - Very High/Critical**
- **Sensitivity Zone B (Orange) - High**: This is the zone located peripheral to the critical core of Vulture activity and

includes areas with frequent and regular foraging by vultures, making them particularly important foraging areas.

- **Sensitivity Zone C (Yellow) - Medium**: This zone primarily includes areas on regular vulture routes between colonies and foraging areas, as well as the locations of recent historic colonies, which are expected to be the first areas of vulture recolonization as a result of natural population recovery and/or targeted actions to enhance natural populations.
- **Sensitivity Zone D (Beige) - Low**: This zone basically includes areas within the Vulture's habitat, but mainly at a seasonal level.

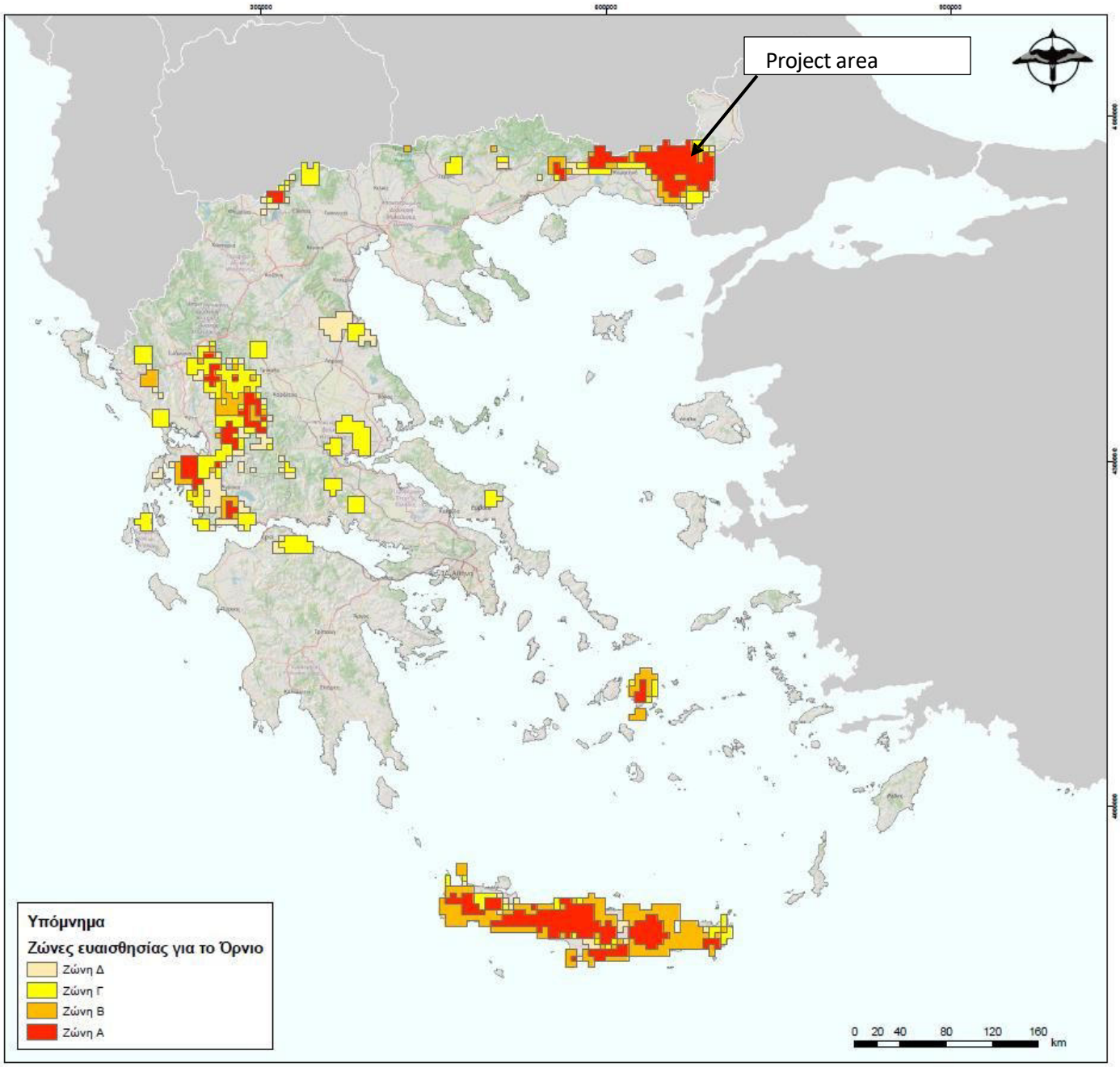


Figure 5.1-1 Sensitivity map of the critical areas of Vulture in Greece (2023)

As shown on the map above, the project area is located within Zone B which is defined as "*the zone located peripheral to the critical core of vulture activity and includes areas of frequent and regular foraging by vultures, making it particularly important foraging areas.*" However, based on field observations by the study team, the Vulture does not regularly pass through the area as it was observed only once in a group of 4 individuals in March (Figure 4.2-9) and in none of the other three observation periods. It should be noted that the sensitivity zone classification of the aforementioned EIA study does not show the areas of bird occurrence in great detail as it uses 5x5 or 10x10 km polygons where the gradients are not discernible at a smaller local scale. This fact makes these sensitivity maps potentially suitable for country or regional level siting issues, but not for impact assessment at the EIA level. This assessment is confirmed by the precision maps for the region produced from telemetry data in a related scientific publication (Peshev et al. 2021) as shown in the figure immediately following. Thus, according to this paper, in no season does the project area fall within the range of the Vulture (except perhaps in spring when its range is slightly closer to the project area and may result in opportunistic observations).
This is also confirmed in the WWF proposal for the proper siting of wind farms in Thrace (2013) as the study area is located more than 10 km away from the zone of increased protection for raptors and the Blackbird (Figure 5.1-3).

Therefore, based on the above, the project area cannot be considered as a high sensitivity zone.

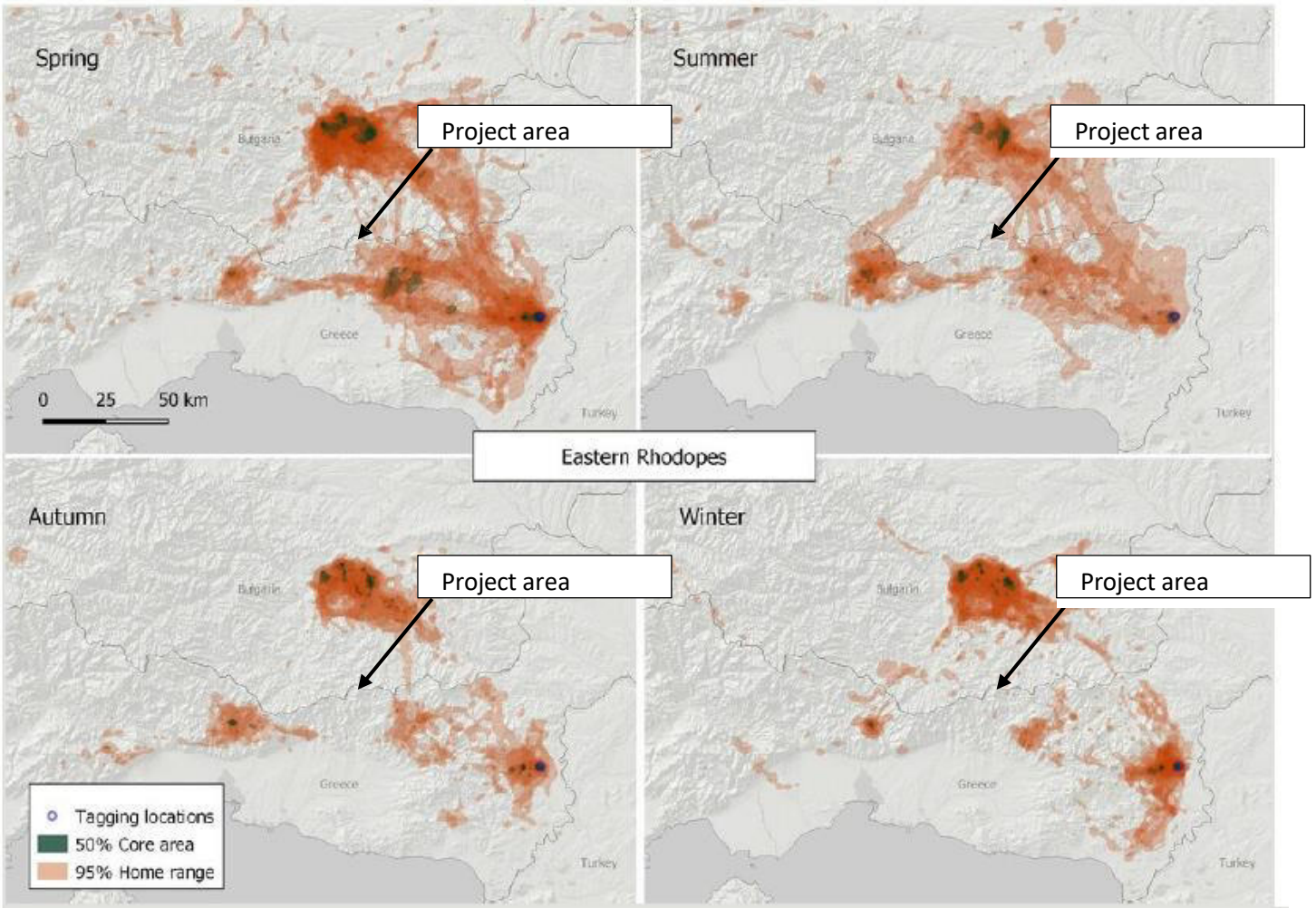


Figure 9. doi

Seasonal home ranges in the Eastern Rhodopes Griffon Vulture zone.

Figure 5.1-2 Map depicting the 95% range and 50% core distribution area for Vulture in the Eastern Rhodopes for each season based on telemetry data (Peshev et al. 2021).

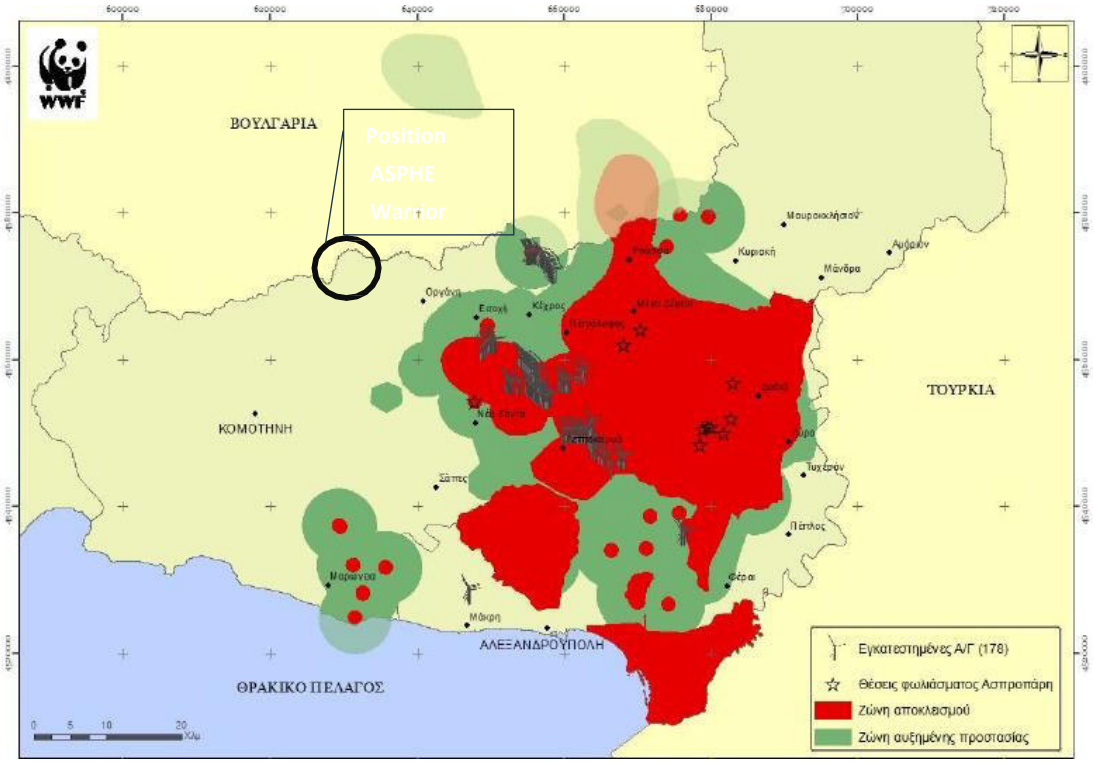


Figure 5.1-3 The red area indicates the Exclusion Zone as the sum of: the high and medium-high use areas based on Mavrogypa satellite telemetry data, the high frequency areas based on Mavrogypa radio-telemetry data, the areas of the EDs of Dadia and Evros Delta, the pine forest of Loutroi, the colony of vultures and the areas of radius 1.000 metres around the nesting sites of birds of prey and the Blackbird nesting area. The green area indicates the Special Assessment Area as the sum of: the areas of medium-low use based on the Black-backed Dipper satellite telemetry data, the areas of medium frequency of presence based on the Black-backed Dipper radio telemetry data and the areas within a radius of 5 000 metres around the nesting sites of birds of prey and Black-backed Stork.

With regard to Snake Eagle (*Circaetus gallicus*), its presence was very limited as it was observed only twice in the south of the study area (Figure 4.2-10 Spatial representation of the observations of the territory and routes of *Accipiter nisus* during the fieldwork; Figure 4.2-11), one individual in March and one in June and thus it is estimated that its territory is outside the project area as it occurs less frequently.

Some of the above species observed are migratory birds that were recorded in the area as transients due to the season and the location of the area, which is close to one of the important bird migration corridors in Greece and therefore functions as an intermediate migratory station for rest and refueling (Figure 5.1-4). Typical examples are migrants nesting for breeding such as *Circaetus gallicus, Emberiza hortulana* and *Lanius collurio*, and may also be transients such as *Ficedula semitorquata*. However, ostrich-like species fly at low altitude and are not expected to be affected by the project (check dam, impacts), while

other migratory species fly at a considerably higher altitude than the turbines and are therefore not expected to be affected by the project.

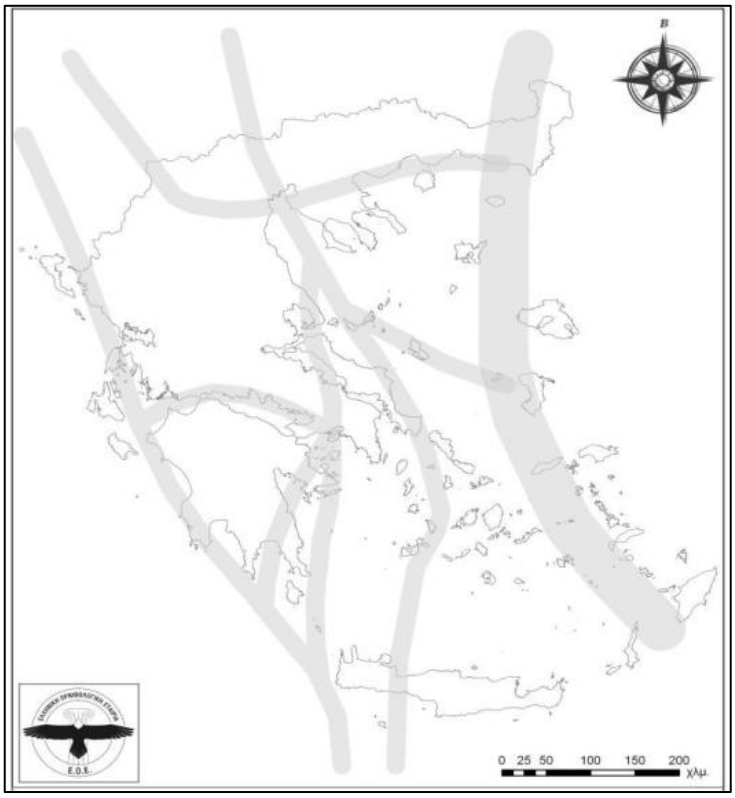


Figure 5.1-4 Main migratory corridors of birds in Greece (source: Hellenic Ornithological Society).

Regarding the pressures and threats to the species of the SPA in crisis GR008 "Filiouris Valley and Eastern Rhodopes", these are mainly related to the increasing construction of roads, intensification of forest exploitation, poaching and the placing of poisoned baits. These pressures are already present and no pressure on habitats and their associated species is expected from the project.

The potential impacts of the project and their significance are then assessed according to the European Commission's guidelines (European Commission, Guidance document on wind energy developments and EU Nature Legislation, 2020).

5.1.1 Impact

Loss of people is also considered during the operation of the wind turbine mainly by bird impact with the blades of the turbines, and secondarily with the pylons, the spindles and the infrastructure (Dimalexis et al. 2010). Impact means the collision of a bird with these wind turbine components. Vulnerable species to such an event are mainly large and endangered birds of prey (Dimalexis et al. 2010).

In the international literature there are many reports on the impact rate of birds, especially raptors, on wind turbines. As an example, a survey of 13 wind farms in southern Spain showed an average Ornithological fatality rate of 0.186 birds/AY/year (Manuela de Lucas 2012).

In Greece, a study in which 88 wind turbines in 9 NPAs were monitored in 2008-2010 by WWF in the area of the wider National Parks and SPAs of Thrace found 9 dead raptors and 73 other birds (Dotau et al. 2011). Each of the 88 wind turbines was monitored every day of the week except Saturday. Monitoring results of the 88 operating wind turbines at the nine wind farms in the region showed a **mortality rate between 0.150- 0.173 raptors/wind turbine/year** according to two calculation equations. This means that, respectively, using this index for the NPP of this study, a mortality rate of 11x0.150=1.65 with 11x0.173=1.90 is expected, **i.e., approximately two raptors per one to two years.** Both estimates, although indicative, **suggest little impact on predator populations.**

It should be noted that although this mortality index was calculated in a region with relatively different local conditions and different predator species composition, it is comparable to other studies (Barrios & Rodriguez 2004, Cárcamo et al. 2011) and therefore can partly give an approximate/indicative picture in this study as well. Furthermore, the area for which it was calculated has a high number of A/C, which is not the case in the immediate project area, as will be discussed below.

In addition, the design choice of the wind farms under study with fewer and larger turbines, spaced further apart than most of the wind farms in the literature (especially the older ones), may be preferable to designing with many, densely stacked, small turbines (May, 2017 and European Commission, 2020). The effectiveness of wind turbine design is supported by some empirical evidence (e.g. Loss et al. 2013), but the influence of increasing rotor diameter (impact risk margin) and reducing rotor speed may, in some intermediate combination, only reduce impact risk. The general rule of thumb for the wind farm area seems to be that the risk is mainly for local predator and nesting species and secondarily for migratory species (De Lucas et al. 2004). Furthermore, it is noted that according to a 13-year study (Ferrer et al., 2022) which will be analysed in the next chapter, the implementation of an A/C shutdown system reduced the incidence of vulture kills by 92.8%.

An assessment is then made based on the specific characteristics and specific environmental conditions prevailing in the protected area, as derived from fieldwork, the history of the specific area and observations of avifaunal features (such as critical habitat) and recorded in the previous chapters.

During the fieldwork of the present study team, the presence of 4 vultures was recorded once. Based on the above, it is estimated that **the immediate project area at the Warrior site is not a core area or core distribution area for the species.** Therefore, the likelihood and significance of any potential collision (and loss) of Vulture individuals to the projects during operation is low and the **impact is not significant to the wider area population or commuter**. The conservation objective for Vulture in the SPA is 300 pairs, therefore the loss of only 1 individual every 6-7 years is unlikely to affect the population (see Section 5.1 - Impact Mitigation Measures). In any case, systematic monitoring during operation is required and if the above impact rate estimate is found to be systematically exceeded during the first 3 years of operation, additional measures will be taken as discussed in the next chapter.

Black vulture was observed in the SPP in 2007 by the EEA and 8 individuals were recorded. It was not observed during fieldwork and thus it is estimated that its critical habitat does not include the project area, so no significant impacts from impact are expected. In addition, the absence of the species in the area is confirmed by the Black-backed Gull Sensitivity Map for the area as published in the Vasilakis et al. (2017) survey and shown in the figure below.

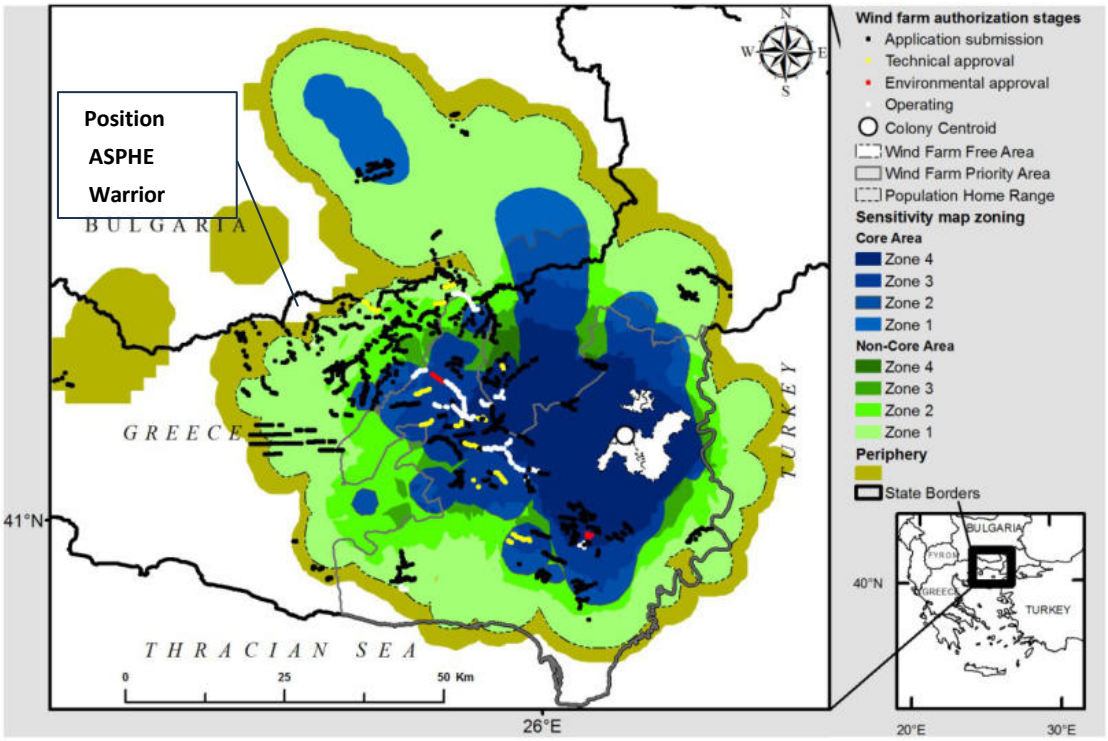


Figure 5.1-5 Map of the sensitivity map of the Black-tailed Godwit in Eastern Thrace (Vasilakis et al., 2017).

The Golden Eagle has one record of one or two individuals in 2000-4 (EEA website), and was not observed during any field visits in this study. It is estimated that due to its uncertain, infrequent and non-permanent presence, there may be no significant impact to the species from impact.

The (Eastern) Kingfisher has one record of two individuals in 2000-4 (EEA website), and was not observed during any field visits of this study, so it is estimated that there may be no significant impact on the species from impact.

Snake Eagle has one record of 10 individuals in 1995 (EEA website), observed only twice in the south of the study area, one individual in March and one in June. It is anticipated that due to its infrequent and non-permanent presence in the CIP, there would be no significant impact to the species from impact. In addition, the conservation objective for the species in the SPA is 300 pairs (Section 4.3) and any loss of 1 individual per year despite conservation measures is not expected to have a significant impact.

The Kittiwake has one record of two or three individuals in 2000-4 (EEA website), and was not observed during any field visits for this study, so it is estimated that there may not be significant impacts to the species from impact.

Egyptian Vulture has one record of two individuals in 2000-4 (EEA website) and was not observed during any field visits of this study, so it is estimated that there may be no significant impact on the species from impact. Results

These are confirmed by the figure below which shows the active territories of the species in 2018 (Saravia et al. 2019) and it is clear that there is no longer any in the vicinity of the project.

Figure 5.1-6 Active territories of the Egyptian vulture in 2018 (blue pin) and formerly active territories in 2013 (pink dots).

The Xeroptera was observed quite a bit in the area during fieldwork with a total of six individuals in 3 of the 4 months of observations. It is judged that there is a territory to the west of the project within half a kilometre however, as it is an abundant species and is not an Appendix I species, it is judged that there would be no significant impact on the species.

The Hawk was the main predator observed in the study area with a total of 39 individuals. It is judged to occupy 2 territories within the project polygon and to be very common in the area. However, as it is not a threatened but abundant species in Greece and is not an Appendix I species, it is judged that there will be no significant impact on it, always after the protection measures proposed.

Therefore, taking into account the international and Greek literature and the specific characteristics and conditions of the protected area, it is assessed that the placement of the ASPEO is appropriate, as it avoids the critical habitats of the characteristic species of the SPA and especially of predators, such as the vulture. Thus, as shown in the above analysis, the **significance of impacting primarily raptors and other birds on the project's A/E elements is low and impacts to populations are not significant.** In any case, **mitigation measures are proposed to reduce** any impacts, including measures following systematic monitoring, as will be shown in the next chapter.

5.1.1.1 Crossing intensity analysis (KERNEL)

In order to get a better picture of the field results, a crossing intensity analysis (KERNEL) was performed. Based on the data from the Surveillance Point Method, a heat map was created as a method of visualizing crossing intensity using the Kernel Density Estimator technique. For this purpose, the vector files of crossing lines were converted to points at 100m intervals along the crossing line (Figure 5.1-7). The heat map shows the density of these points in the form of a "buffer zone" around each pixel (selected pixel size 0.1x0.1) since the analysis is in raster format. The size of the zone radius is determined accordingly, according to the nature of the phenomenon under consideration. In this case, a radius of 500m was chosen which is approximately the spacing between the A/Cs in the studied ASPHE. Kernels were calculated based on the total crossings of all species. From the raster probability density file (kernel) the equal probability crossing curves were generated and are illustrated in the following figures (Figure 1 and 2).

Kernel density estimator -Kernel density estimator***:*** *the Kernel estimator is a Probability Density Function, called a Kernel, which is placed over each data point, and the estimate is obtained by adding all the data points. In this way where there is an accumulation of many points, the kernel estimate has a higher density. For this analysis we used the quartic (biweight) function in QGIS 3.6, the add-on for creating intensity maps (heatmap) from point vector files and the add-on for creating isopleths .*

A schematic illustration is provided below (Figure 5.1-7):

- The crossings of all raptor species of avifauna regardless of their flight altitude (White-tailed Godwit - *Accipiter nisus*, Hawk - *Buteo buteo*, Snake Eagle - *Circaetus gallicus*, Vulture - *Gyps fulvus*) observed during the field survey,
- The number of points along the crossings included in the analysis (1 point/100m),
- As a background, the thermal transverse intensity map has been used (illustrated unmodified in Figure 5.1-8).

In essence, the warmer areas (red colour) reflect the higher density of points and thus the density of passage of the studied birds of prey.

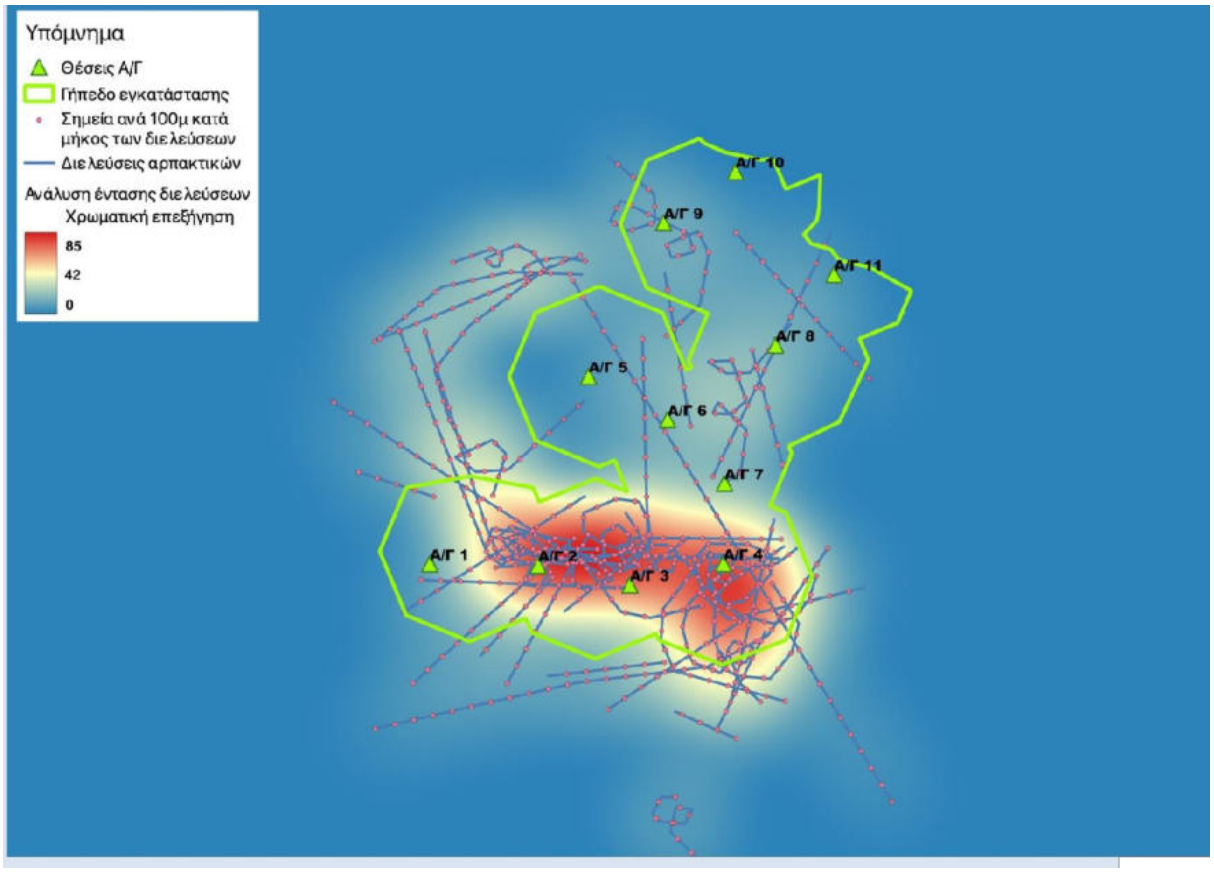


Figure 5.1-7 Extent of crossings of avian predator species (White-tailed Godwit - Accipiter nisus, Hawk - Buteo buteo, Snake Eagle - Circaetus gallicus, Vulture - Gyps fulvus) in **relation to the geospatial representation of the crossings and longitudinal points (1 point/100m of course) in the area of the studied ESDP. Higher intensity of transects is depicted in red and absence of transects in blue. The numbers in the colour explanation of the footnote correspond to the density of points within a 500m radius.**

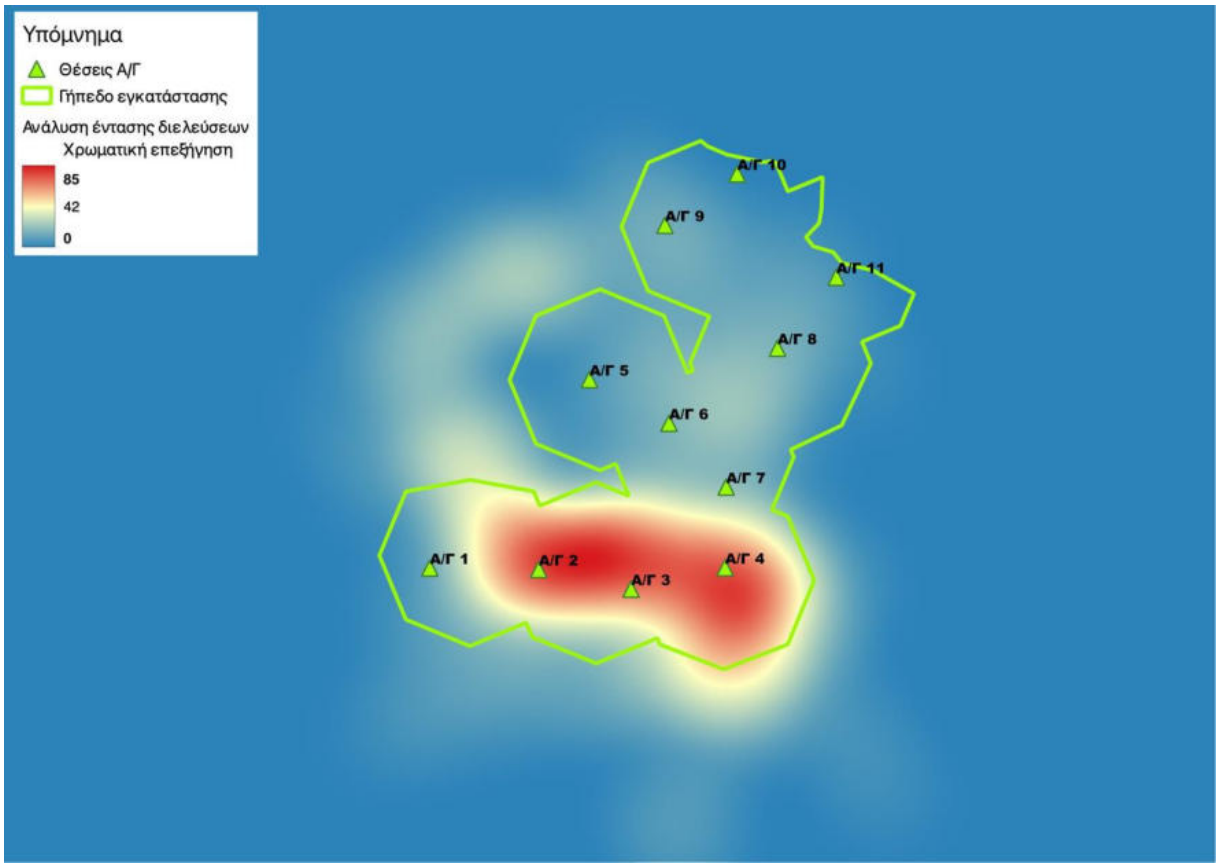


Figure 5.1-8 Analysis of the intensity of crossings of avian predator species (White-tailed Godwit - Accipiter nisus, Hawk - Buteo buteo, Snake Eagle - Circaetus gallicus, Vulture - Gyps fulvus). The highest intensity of crossings is shown in red and the absence of crossings in blue. The numbers in the colour explanation of the footnote correspond to the density of points within a 500 m radius.

As can be seen in the above maps, the A/Es with the highest density of crossings are 2-4 (>42 points in a 500m radius for each 0.1x0.1 pixel). A/Es 6-9 (<42 points in a 500m radius for each pixel 0.1x0.1) are located at points of moderate-low passage of avian predators. It is clarified that in the red area within which A/Es 2-4 fall, 86% of the points belong to the passage of Hawk (*Buteo buteo*), 9% to White-tailed Godwit (*Accipiter nisus*), 3% to Snake Eagle (*Circaetus gallicus*) and 2% to Vulture (*Gyps fulvus*).

5.1.1.2 Crash Risk Analysis (BAND)

In order to assess the risk of each species colliding with the ASPEO A/Cs, the BAND model (Band, 2007) was applied for the 3 raptor species observed within the risk zone, namely the Common Hawk (*Buteo buteo*), the White-tailed Godwit (*Accipiter nisus*) and the Vulture (*Gyps fulvus*).

The fact that it is one of the most widely used models and proposed by the EU Wind Energy Projects Guidance Document (EC, 2020) has been criticised (e.g. Chamberlain *et al.*, 2006). It is therefore recommended that it is used in conjunction with all the ornithological data obtained during the field survey to properly assess potential impacts.

In a first step, the number of people crossing the rotor of the A/C was estimated. Based on the "afpt" model (Heerenbrink *et al.*, 2015), two flight speeds (which result in the duration of the birds' stay within the danger zone) were calculated for each of the species when crossing the area of the AIS (cross-country gliding). These values (minimum and maximum) depend on the individual's climb rate within the thermal stream (climb rate) and are achieved when birds move between two thermal streams (inter-thermal gliding) at optimal speed (Pennycuick, 2008). Therefore, based on the speed of the birds, the daily number of dangerous flights and the presence of the species in Greece (Table 5.1-1 and

Table 5.1-2**)** estimated the number of dangerous crossings from the ASPEO per year
(

Table 5.1-4). Dangerous flights are defined as crossings within a radius of 250 m from each A/C and within the altitude range of the A/C wings, i.e. from 50 m to 200 m.

The required morphological data for the above species were obtained from a variety of sources listed in the literature. In addition, Table 5.1-3 lists the characteristics of the A/C taken into account for the calculation of the impact risk**.**

Table 5.1-1 Summary of the Monitoring Point method surveys for raptor species recorded within the ASPHE hazard zone.

a/a	PRODUCT	COMMON NAME	PEOPLE	OBSERVATIONS	NUMBER OF PERSONS/OBSERVATION
1	*Buteo buteo*	(Common) Falcon	38	31	1.2
2	*Accipiter nisus*	Xefteri	2	2	1
3	*Gyps fulvus*	Vulture	4	1	4
	TOTAL:	**2 types**	**44**	**34**	

Table 5.1-2. Data taken into account for the calculation of the passes from the space defined by the rotors.

Kind of	Bird length (m)	Bird wingspan (m)	Airspeed (m/sec) (min-max)	Status of presence	Time of presence of people in the risk area (sec)	Time required for bird to pass through rotor (sec)
Accipiter nisus	0.35	0.69	2.69-18.285	Epidemic	2.6	0.25-1.7
Buteo buteo	0.49	1.25	4.56-12.08	Epidemic	5.1	0.39-1.03
Gyps fulvus	1.25	2.48	13.84-18.38	Epidemic	1.22	0.29-0.38

Table 5.1-3 Data taken into account for the calculation of the impact risk.

Parameter	Price
Type of A/C	V150-4,2
Number of blades	3
Rotor diameter (m)	150
Rotation speed (rpm)	15
Max chord	4.2
Tower height (m)	125
Maximum height of A/C (m)	200
Number of A/Cs	11
Risk space volume (m3)	288750000
Rotors volume (m3)	816421.4

In a second stage, the probability of impact with the wings of the A/C for each species was estimated when passing through the rotor. The BAND model according to the above data calculated (for maximum and minimum flight speed) the probability of impact with the turbine rotors, in principle without any prediction of avoidance by birds.

Table 5.1-4 Analysis of passage observations of raptors passing within the Hazard Zone based on the "afpt" model (calculation of maximum and minimum flight speed) and BAND (number of individuals within rotor volume, probability of collision mortality, and estimate of dead individuals per year (without avoidance).

Kind of	Number of flights within EPZ/year	Minimum / maximum flight speed (m/s)	Number of persons within rotor volume/year	Probability of fatality [p(collision)]	Dead birds Per year according to the Band model
Accipiter nisus	164	2.69	1.56	0.32	0.5
		18.29	10.6	0.08	1.81
Buteo buteo	3116	4.56	5.02	0.21	1.06
		12.08	13.3	0.10	1.31
Gyps fulvus	328	13.84	3.2	0.13	0.41
		18.38	4.26	0.11	0.47

Interpreting the results from the application of the above models, we consider the case of Hawksbill (*Buteo buteo*) with the most crossings within the danger zone. It is observed that for minimum and maximum flight speeds of 4.56 m/s and 12.08 m/s respectively, the number of hawksbill individuals passing within the rotor volume is 5.02 and 13.3 per year respectively. The probability of mortality is 21% for low speed and 10% for high speed, given that it traverses the rotor zone in less time.

It should be noted that **no avoidance factor has been applied** in the above analysis. However, it has been found through research on bird mortality in wind farms that birds in good visibility conditions **tend to avoid A/Cs at a rate of more than 95%** (Chamberlain *et al.*, 2006). As an example, the Brahominus is cited for which international studies (Scottish Natural Heritage) have shown that due to their flight flexibility, they can avoid impact with turbine blades to a very high degree (up to 99%). Avoidance behaviour changes with changes in visibility in adverse weather conditions or during the night (Winkelman, 1992; Still *et al.*, 1996). However, **without applying the avoidance factor, unrealistic predictions result, as has** been found in bird mortality studies on wind farms (Ferrer *et al.*, 2011). Therefore, Table 5.1-5 provides the probability of mortality estimate for raptors identified within the hazard zone, accounting for the avoidance probability (95-99%).

Table 5.1-5 Estimation of the probability of birds colliding with the A/Cs with the inclusion of an avoidance factor (95-99%) and estimation of a minimum kill interval.

Kind of	Dead birds per year with 95% avoidance	Dead birds per year with 97% avoidance	Dead birds per year with 99% avoidance	Estimated years to kill 1 person (95% avoidance)
Accipiter nisus	0.025	0.015	0.005	39.84
	0.040	0.024	0.008	24.78
Buteo buteo	0.053	0.032	0.011	18.90
	0.066	0.039	0.013	15.23
Gyps fulvus	0.020	0.012	0.004	49.21
	0.023	0.014	0.005	42.68

As can be seen from the above table

- in the case of **Falcon**, applying the lowest avoidance factor (95%), **it is estimated that the minimum time to kill a person passing through the danger zone is 15-19 years**.
- For **Xefteri** with the same avoidance factor (worst case) **25 to 40 years**
- For **Ornio**, with the same avoidance factor, **43 to 49 years**

It is clear from the above that the probability of impact mortality is negligible for all of the above species and the population of none of the above species is at risk of significant impacts.

5.1.1.3 Impact with cables and electrocution

Another source of risk of bird deaths from impact, but also from electrocution, is power lines, according to international literature.

Between 2009 and 2013, electrocution on electricity transmission pylons was responsible for the deaths of 67% of the marked Basileans in Bulgaria. In Sudan, the infamous power transmission line that runs from Port Sudan to the Red Sea coast is estimated to have killed hundreds or even thousands of Egyptian vultures since it was built in the 1950s (https://old.lifeneophron.eu/gr/news-view/305.html).

However, the connection of the generators to the substation is made with underground wiring, so there will be no impact on the birds of the area.

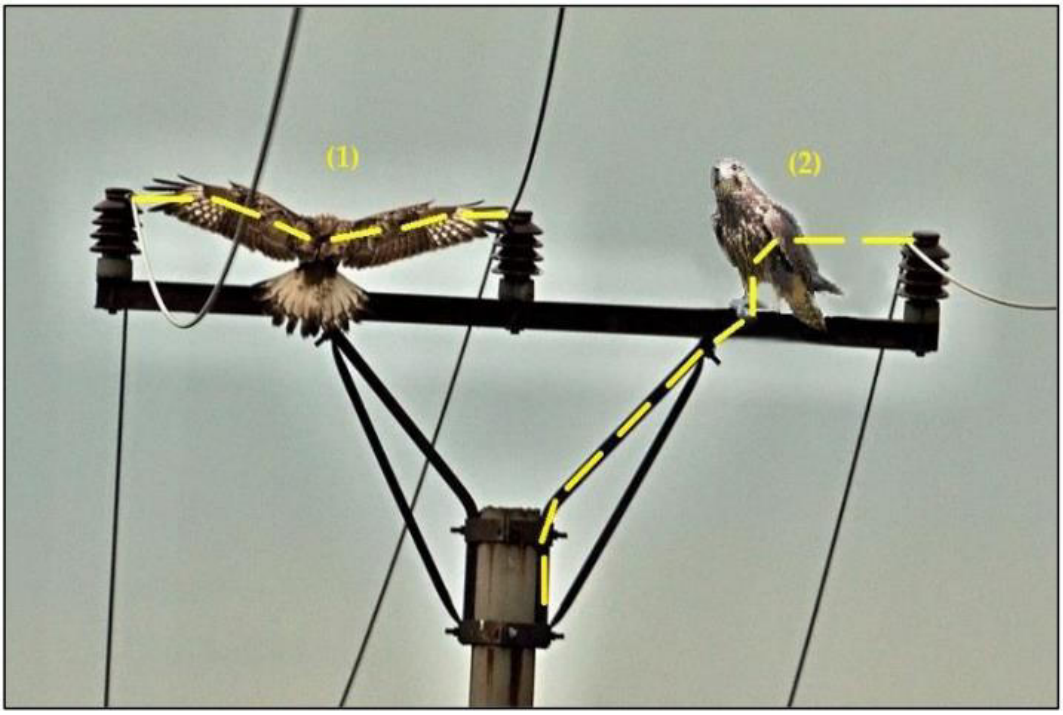


Figure 5.1-9 Typical cause of electrocution in medium voltage poles (Raptor Protection of Slovakia, 2019)

5.1.2 Nuisance and displacement

Overall, during the construction phase, there may be disturbance from the noise of machinery and operations during the day. The disturbances are observed during the construction of the project, such as access roads, earthworks and concreting of the foundations of the main A/C). In addition, disturbances may also be caused by light at the construction sites during the night.

During the operational phase, impacts may be caused by the noise from the operation of the A/Cs.

In general, disturbance to bird species depends on the size and extent of the disturbance and of course on the season. For all bird species, the impact is greatest during the breeding season as it can cause nest abandonment and breeding failure for that year or even permanent displacement from the area in the case of breeding raptors. In addition, one parameter for assessing the impact of disturbance on avifauna is the distance from the source, which again is different for each species. According to the literature, these distances vary considerably depending on the local conditions and the species present in the area where the disturbance occurs. These disturbances usually affect a radius of a few tens or a few hundred metres.

According to research on the reproductive success of the Black-backed Gull, which can also be considered as an umbrella species for predators, it was estimated that a threshold for anthropogenic disturbance with traffic noise is a noise level of Leq24h = 40 dB(A) (Esther Ortiz-Urbina, 2020). Specifically, the study found that the traditional view that disturbance to predators is a function of distance from road traffic may be overestimated. Instead, disturbance from traffic noise should be considered with the above threshold. The assessment

this can be extended with reasonable certainty to disturbance from other anthropogenic activities, such as wind turbine construction.
In the case of the "Warrior" ASPHE, it is estimated that the construction of the plazas and roads would not disturb any raptor nests with noise as no raptor nests were detected in the Field Survey Area, with the exception of a possible Hoochooris nesting site at a distance of more than 850 m from the nearest A/C. In any case, as a precautionary measure, it is recommended that measures be taken for these locations, as will be shown in the next section.
The disturbance from artificial lighting at night (during the construction phase) can affect nocturnal species, which are sensitive to bright light, if no action is taken. With appropriate measures, this impact becomes insignificant.
Overall, noise nuisances are expected at short distances from the works (a few tens of metres) and nuisances from site lighting can also be avoided to a significant extent after measures. In any case, impacts during construction from both noise and lighting will not be significant to site integrity and biodiversity and will be temporary during construction.
During the operational phase, no significant impacts are expected since no significant nesting sites were observed near the turbines and there will be no intense lighting. In addition, the adoption of the appropriate measures proposed below will help to further reduce impacts.

5.1.3 Barrier impact

The issue of the impact of the operation of A/Cs when acting as a barrier to bird flight has been a concern to the research community. Although many concerns have been raised about the barrier function, this assessment has not been well documented and is certainly different for different bird species and for each type of project (topography, layout, height and density of A/C, etc.). Recent research work for the Ebro region has shown, despite the density of vulture use of the area and the density of A/C, that it does not have a negative effect as a barrier to vulture movement[2] . The project at this location does not have characteristics that could have a significant negative effect as a barrier to other raptors and characteristic species in the area, even after impact avoidance measures have been taken.

5.1.4 Direct loss of individuals and Habitat Degradation - Habitat Degradation

The habitats identified in the Field Survey Area according to Corine land cover and their distribution in relation to the area of the SPA are shown in the table below:

[2] *Sidiropoulos, L., Chatzinikolaou, G., Kret, E., Kapsalis, E., Zakkak, S., Arkumarev, V., Dobrev, D., Stamenov, A., Stoychev, S. & Vasilakis, D. 2022. The effects of industrial wind farm development in three priority raptor species in Thrace: cumulative collision mortality and displacement of Cinereous and Griffon Vultures and Golden Eagles. The Society for the Protection of Biodiversity of Thrace. Dadia-Soufli, 92 pp.*

Table 5.1-6 Distribution of land cover in relation to the area of the MPA

CORINE CODES	CORINE SURFACE INSIDE OF THE CIP (km)²	% OF THE SURFACE AREA SPP
311 Broadleaf forest	**137,17**	**16,62**
321 Natural pastures	**0,29**	**0,11**
324 Transitional woodland scrubland	**0,25**	**0,03**
SURFACE AREA OF THE CP	**825,54**	100
CIP AREA	**5,86**	**0,71**
SURFACE OF INTERVENTIONS	0,14	0,02

The above table shows that the total interventions (construction of squares, road construction) occupy only 0.02% of the CP.

According to the field survey conducted, the main habitat-land use dominating the intervention areas of the Warrior ASPHE and its accompanying projects, as noted in Table 5.1-1, is the broadleaf (deciduous) forest (16.62% of the habitat area within the MPA in relation to the total area of the MPA), followed by the cover (and use) of natural grassland (0,11% of the total habitat area of the MPA) and transitional wooded shrubland (0.003% of the habitat area within the MPA in relation to the total area of the MPA). The description of these habitats, documented and supported by photographic extracts, has been provided in previous chapters. Based on the exact area of encroachment, the project occupies an area of 0.14 km^2 , which is only 0.10 % of the Corine 2018 land use area "311 Broadleaf Forest" in the SPP and thus does not significantly affect the extent of the project (as a largely point and linear project with small areas of encroachment).

According to the analysis preceding chapter 4, as shown by the absence of important nesting sites and the images of predator movements in subsection 4.2, the plaza areas (mostly) and their accompanying works such as access roads and underground cabling (for the most part) are outside of important habitats and especially outside of the habitats of important predators such as the Vulture and the Snake Eagle. Therefore, the construction activities and their subsequent use in the operation of the project would not reduce any habitat area of the characteristic species. However, even assuming that these individual projects in Table 5.1-1 are included in the secondary foraging habitat, their extent relative to the total foraging habitat of the SPA, as shown by the percentages in the same table, is almost negligible, only 0.02% of the total projects in terms of the area of the SPA. Besides, these habitats are scattered and abundant throughout the region and the species active there use more than one habitat type. Finally, the projects are not located in areas that could support nesting habitat for the endangered species under consideration, therefore no significant impact on raptor nesting habitat is expected during project construction and operation.

As for the underground connection network, due to their very small footprint, this will have a negligible impact on the area through which they pass during construction and no impact during operation and therefore there will be no significant impact.

In conclusion, there will be no significant loss of the habitats mentioned above as a result of the installation of the ASPHE. These habitats are scattered throughout the area and the species that operate there use more than one type of habitat. In addition, as the substation and the external network

25 km of interconnection are existing and no additional work will be required for these elements of the project. In addition, no sites that could host nests of the threatened species under consideration are identified in the project installation polygons and thus, no significant impacts on avifauna species from loss or degradation of habitat and habitat are expected either during the construction phase or during operation of the project.

5.1.5 Habitat fragmentation and Habitat-Habitat degradation

There would be no fragmentation of raptor nesting habitat, as no nesting is observed in the project area (except for the Hoochoorist, which is outside the project site). Due to the geomorphology of the surrounding area, and the land cover, as shown on the Corine maps, foraging and wintering of the species is not expected to be significantly affected. However, it is suggested that earthworks and concreting works be undertaken outside of the breeding season to avoid damaging nestlings' nests.
In terms of flight energy wastage, mainly of large raptors and falcons, but also of other species passing through the area, during the operation of the project, it is estimated that it will not be significant. The small reduction in mainly occasional foraging habitat due to the facilities is not expected to cause significant interception of flights. It is estimated that the potential minor diversion of natural flight continuity would be non-significant and therefore would not result in a significant increase in energy costs for birds.

5.1.6 Indirect effects

Such impacts relate to a reduction in the availability of game in the area of the ASPHE. However, relevant management measures are being taken in a subsequent chapter, which are estimated to offset associated impacts to avian species (e.g., provision of food at feeders outside of the ADFA area).

5.1.7 Cumulative impact

In the immediate area of the Rhodope mountain range in northeastern Komotini (and northwestern Arrianoi), the construction and operation of the "Warrior" RES-E plant, which already has a production license, is expected. According to the data, the area occupied by the project with 11 generating units amounts to 140,681.83 m^2 . There are no other existing RES-EEOs in the area near this project. A total of 16 wind farms with installation permits and a total of 180 wind turbines have been licensed in the SPP at a distance of more than about 10 km. All projects are concentrated in the central and eastern area of the SPP. Thus, because these wind farms are widely spaced there will be no cumulative or synergistic impacts. However, there are also 3 wind farms with 11 wind turbines at a distance of more than 3.5 km and less than 10 km that while they only have a Production Licence, they also have an EPO and so are more likely to be licensed. Thus, if all the projects are implemented, there will be a total of 22 Gensets in the immediate study area. Based on the mortality rate mentioned above (22*0.150-22*0.173), it is estimated that 3-4 raptors per year will die on impact in the entire SPP. However, with protection measures as described below, the impact, if any, would be even more limited and the mortality rate could be much lower, almost negligible.

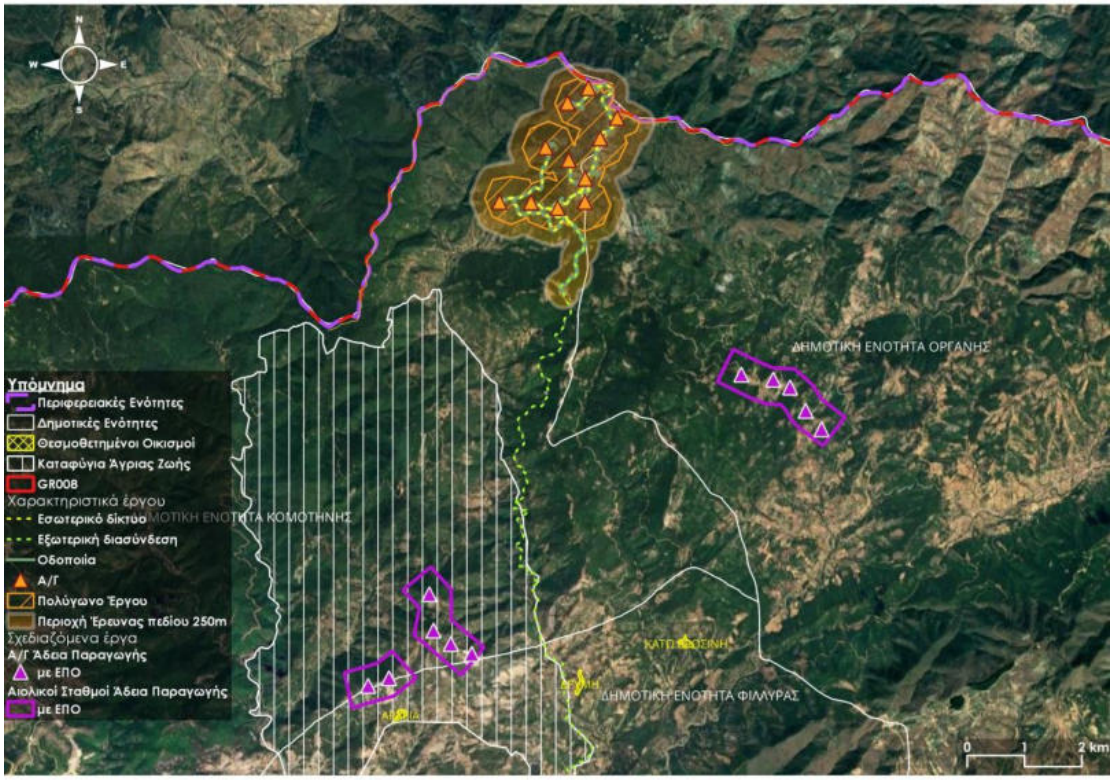


Figure 5.1-10 Map of synergistic impacts with planned Wind Farms in the wider project area (up to 10 km)

Considering the synergistic impacts at the level of the GIS, with the implementation of the project under study, a total of 191 wind turbines will be installed. Based on the mortality rate mentioned above (191*0.150-191*0.173), it is estimated that 28-33 raptors per year will die on impact in the entire SPP. Although this number is not insignificant, it is estimated that the project under study does not contribute substantially to its increase for the reasons that it is located far enough away from other projects (thus not contributing to a potential barrier or habitat fragmentation), its location is on the edge of the SPA, its area is not a nesting site for raptors-except for the Hoopoe, and with protection measures as described below, impacts would be even more limited and the kill rate would be much lower.

As regards projects with a Generation Licence, these are not taken into account in the assessment of the cumulative-synergistic impacts, as the Electricity Generation Licence does not in any case ensure the implementation of a RES project, as it is essentially a feasibility licence. In other words, it is assumed that when the EU guidelines state that proposed projects (with a request for authorisation/approval) should also be taken into account, they mean the environmental permitting and final approval process of the projects by the competent body (Ministry of Environment or the relevant Decentralised Administrations and so on), and not the producer certificate which is essentially given through formal procedures by another regulatory authority (RAE) without environmental control. Therefore, it is not appropriate and of no value to consider projects that only have a producer certificate since they are at a very early stage of final licensing, and projects in a changing licensing landscape. There is no point in comparing projects with an environmental permit or even installed projects with only a producer certificate. The former with considerable certainty will be built. The latter have not submitted

Even if they do not apply for an environmental permit, or even when they do, there is a very serious chance that they will be rejected, as when they received the producer certificate their file was not environmentally checked. According to ELETAEN data, the implementation rate of projects with a production licence or producer certificate is only 3%. However, even this percentage is not specified in the field which projects are licensed out of the total, so it is not possible to take these projects into account in the synergistic cumulative impact.

Examining the images of the distribution and areas of habitual flights of the SPC species found in chapters 4.2 and 5.1, we observe that the A/C of the ASPHE
"Warrior" are outside the core territory of predators in the area (with the exception of Common Hawk) and furthermore no nesting was detected within the polygons. **These data support the assessment that the wind farm in this study will not have cumulative negative impacts in terms of risk of predator collision with other projects in the region** beyond those expected from the Warrior wind farm itself (as discussed in the previous subsections), either during construction or operation. It will also not have a cumulative effect on impacts from various projects in Bulgaria, as the area near the project and on the territory of the neighbouring country is an EPZ and does not host raptors and other birds protected and sensitive to impacts. In addition, as this study's ESCO has no overhead power line sections but only underground network connected to the voltage step-up TS, it cannot contribute cumulatively or synergistically to an increase in risk of collision with cables or electrocution.

5.2 Types of Handhelds

The species of chironomids that can be identified in the area based on their distribution maps (Section 4.1) belong both to the species found in Greece and Bulgaria. The species listed in the Red List of Greece under the category Vulnerable (VU) is *Rhinolophus mehelyi*, however this species does not have its main distribution in the project area. Of the species relevant to Greece, although common in our country, the species *Rhinolophus euryale, Rhinolophus blasii, Miniopterus schreibersii* and *Myotis capacinii are in* the Vulnerable (VU) category of the Red List of Europe (the latter does not have a baseline distribution in the project area - Chapter 4.1). Also, although the species are found throughout Greece and are common, they have an Insufficient Conservation Status (U1). Regarding the bat species from the Bulgarian EEZ, in the Red List of Europe in the **Vulnerable (VU)** category **are *Barbastella barbastellus, Myotis bechsteinii* and *Rhinolophus blasii***. Although impact mortalities of individual bats cannot be ruled out, the number of these, due to the characteristics of the project and the area, is estimated to be small and may not have an impact on the bat population. In addition, based on their (wide) distribution maps and confirmed presence locations (dots), the field survey area does not appear to be critical habitat for bats. Similarly, no impacts from habitat fragmentation and displacement are expected, especially after protection measures have been taken.

In addition, these conclusions are reinforced by the fact that the area of the studied ASPHE is located outside the zone of the feeding zone of Chironomid Colonies and Important Caves and Shelters of Chironomids according to the results of actions A3 and C3 of the LIFE17 NAT/GR/000522 - LIFE GRECABAT project, 2021-2023. The closest

The feeding area is called "Supajin Ine Cave" and is located at a distance of about 3 km as shown in figure 5.2.1.

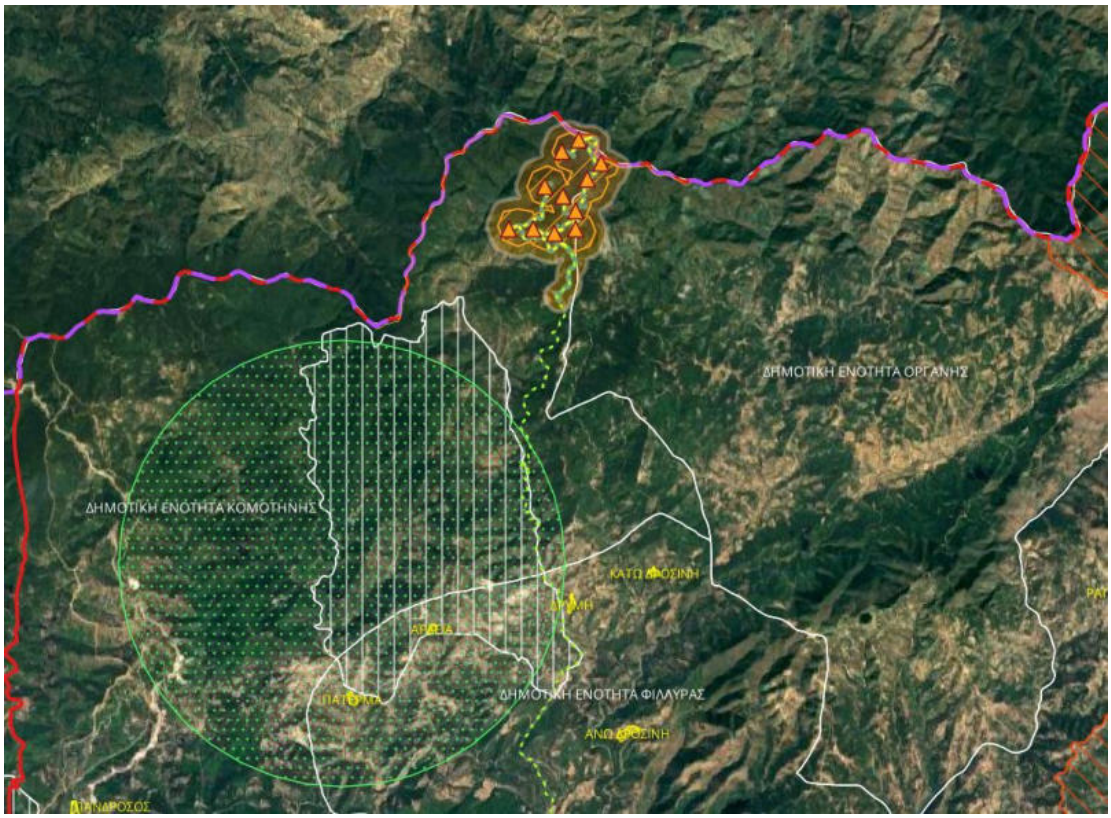


Figure 5.2-1 Foraging areas of chironomid colonies (green dotted circle) in relation to the project under study and the CIP (orange polygon).

However, apart from the bibliographical data known for the area, a field visit was made and a record of the species of chrysopters in the area of interest was made.
In order to assess the impacts of the installation and operation of the project under study, the following are taken into account:

- the intensity of the presence of the Handfisher as the number of sound recordings made during the overnight counts
- the direct loss or change of feeding habitat or other habitat
- the presence of a colony of chironomids near the study area
- the presence of species listed in Annexes II and IV of Directive 92/43/EEC.

From the results of the data analysis as obtained during the field survey, it is concluded that the project area has a **high number of species and high activity of important species of chironomids**. In total, 19 species of chironomids were identified, 5 of which belong to a risk category of the Greek Red Data Book and/or the European Red List (IUCN), all species belong to Annex II and/or IV of Directive 92/43/EEC, the conservation status at national level for 12 species is inadequate (U1) and for 4 species satisfactory (FV).

5.2.1 Impact on the nearest colony of chrysopters

As mentioned above, part of the underground electrical interconnection passes through the feeding area of the handrails that take refuge in the "Supajin - Ine" cave. This section is more than 4 km away from the important cave/shelter for

worse. Moreover, the nearest wind turbine of the project is more than 8 km away from this important cave. Results during the field survey period indicate that the colony is inactive at least in terms of its use as a breeding refuge, consistent with the literature which notes that the active period is during March and April. For the other months of the year, the use of the cave by chironomids is not known in the literature. However, field results from the project area (of the A/Gs) indicate some presence of cave species (*Miniopterus schreibersii, Rhinolophus ferrumequinum and Rhinolophus euryale*) during this period of measurement as well.

Impacts from the construction of the project and its companions under consideration may be from noise disturbance from machinery and habitat occupation.

The nature of the undergrounding of the cable does not tie up land within the feeder area as the cable follows the alignment of an existing road. Similarly, the road improvement does not practically increase the land take. Therefore, there **would be no change or new habitat occupation from the construction and operation of the project and its concomitants.**

With regard to noise from construction activities, the noise associated with each construction phase varies considerably. The equipment used in each of these phases varies in intensity, duration and frequency of noise generation. Based on literature, the range of noise ranges from 52 to 162 dBA (U.S. Fish and Wildlife Service, 2006), with the most frequent noisy operations ranging from 80 to 110 dBA. All sounds diminish with increasing distance from the source. Noise from point sources, when diffused over soft ground, decreases by 7.5 dBA each time the distance is doubled (The California Department of Transportation, 2016).

The minimum distance of the colony from the underground cable line and access road improvement is over 4 km, while the internal road construction and A/G installation works are even longer (over 7 and 8 km respectively).

According to the project's EIA, the noise from the construction of the road (and the underground line) at a distance of 600 m from it is reduced to 39.7 dB(A), i.e. it reaches approximately the background value (taken as 35-40 dBA). Therefore, the cave, which is more than 4 km away, will not suffer any impact. Similarly, there will be little disturbance even in the part of the feeder close to the access road, since, according to the EIS, at a distance of 300 m from the road axis, the noise is reduced to 46.2 dBA, i.e. only a slight increase compared to the background. It is pointed out that the length of the road in contact with the feeding area is
5,350 m, and according to the EIA, the construction time of this section is estimated at 26 days.

Therefore, the construction of the access road to the section within the foraging area will have no impact on the bat species of the "Supajin - Ine" Cave due to distance, throughout the year. In addition, any disturbance (if any) will last less than one month, in which time the works will be carried out. Similarly, and the work of widening the internal roads and the A/G plazas will have no impact on the colony's handrails due to the long distance, with the nearest A/G to the cave being about 8 km away.

5.2.2 Impact on handrails due to occupation/habitat change and disturbance on the installation site

The construction of the ASPHE project and accompanying road works may result in the reshaping of the landscape, removal of surface vegetation and commitment of space within foraging or foraging habitat. Through this process existing habitats may be altered, damaged, fragmented or destroyed. The extent of habitat loss and degradation depends on the size, location and design of a project and the sensitivity of the habitats affected (EU, 2018). However, in the case of this project, which is located outside Natura 2000 protected areas, the area covered by deciduous forests in the wider area in the Rhodope Mountains is particularly large. In fact, according to the EIA of the project, it occupies an area of 0.14 square kilometers (140 acres) which is only 0.10% of the land use area per Corine 2018 "311 Broadleaf Forest" in the SPA. Therefore, the loss of potential habitat is negligible compared to the large area in the region and therefore **impacts from habitat occupation of the project components are expected to be low and insignificant.**

It is also noted that, due to the existing density of vegetation in the project area, it is currently very difficult to forage for bat species with lower manoeuvrability. The removal of vegetation during fieldwork practically results in the opening of corridors within the dense vegetation and the formation of habitats that provide foraging and foraging habitat for a wide range of species, not only of arthropods, but also of insects, mammals and birds. Therefore, it is **likely that the diversity and activity of chironomids in the project site will increase**. However, this positive effect on the population may be offset by a **potential** increase in **interspecific competition for the most prevalent species** (Micro Bat, Nanon Bat and Nightjar) due to the attraction of more bats to the site.

In any case, in line with what has been developed in the previous chapter, based on the EIA, no significant impact on the acoustic environment is expected in the area of the A/Cs during construction, since within a few hundred metres the noise will approach or reach background noise levels. Moreover, any disturbance will be short-lived. After all, the excavation, backfilling and concreting operations (which are the main noise emitters) as described in the EIS are all carried out during the daytime, when the handrails are not active. Therefore, also in the area of the A/C development site, the impacts on the handlers during construction are not expected to be significant, since on the one hand the duration of the works will be limited and on the other hand the disturbance will only be caused to the handlers using the RAP for resting (during the day), while during the night when no works are carried out, the RAP can be used as a feeding area without any disturbance.

5.2.3 Impact of the operation of the project

Over the past fifteen years, data have been accumulated documenting negative impacts of ESU on populations of chironomids (Dietz et al. 2009, Dietz & Kiefer 2016, Rodriguez et al. 2017). These studies document instances of chinstrap kills by wind turbines. Handflies are killed on the one hand due to impact with the rotating blades of the wind turbines, on the other hand due to
"barotrauma", i.e. internal bleeding caused by reduced pressure (hypotension), mainly near their extremities. However, as reported in the MPE, more recent research overestimates the initial estimates of a significant impact

by barotrauma compared to impact killing, as the area of increased underpressure behind the blade tips is of very small area compared to the swept area of the blades. Thus, the probability of bats passing through this area is much lower than the probability of bats passing through the swept area (Lawson M. et al., 2020, as cited in: "...*we conclude that it is unlikely that barotrauma is responsible for a significant number of turbine- related bat fatalities, and that impact trauma is the likely cause of the majority of wind- turbine-related bat fatalities*").

The recording of handler activity by acoustic methods before construction shows a positive correlation with post-construction mortality. However, these results cannot be used to accurately predict mortality because of the many other factors involved, some of which are poorly known (Hein *et al.* 2013).

Recent studies (Donald *et al.,* 2020) suggest that in some cases chiral moths are attracted to A/C, increasing their activity and thus the chances of mortality.

In the case of the project under study, the activity of handflies, according to the field survey, is characterised as high, while the most prevalent species: the Micro Bat (*Pipistrellus pygmaeus*), the Nanobat (*Pipistrellus pipistrellus*) and the Nighthawk (*Nyctalus noctula*) are species vulnerable to impacts (**Table 3**; EU, 2010) and thus it is expected that the number of impacts will not be low. However, taking into account the fact that these species are common and non-endangered, **it is estimated that the overall impact from impact with A/C (or causing barotrauma) on the populations of chironomid species in the area would be moderate.** In addition, no impacts from habitat loss are expected as this is an extremely small percentage of the area of existing habitat in the immediate and wider project area.

5.2.4 Transboundary effects on the species of pests

Of the 19 species observed in the field, 5 of them (*Barbastella barbastellus, Miniopterus schreibersii, Myotis capaccinii, Myotis myotis* and *Rhinolophus hipposideros*) are included in the protected species of the TED (Table 3.2) of the neighbouring SPA "BG0001032" of Bulgaria. Of these, only *Barbastella barbastellus* is Vulnerable (VU) and had a presence rate well below 1%. The same is true for the other species, which also had a very low presence rate of less than 1%. **In conclusion, based on the results of the field survey, no significant transboundary impacts on the populations of the worst affected Natura 2000 "BG0001032" - Rodopi - Iztochni.**

5.2.5 Conclusions of an impact assessment on handrails

- High activity and a high diversity of chironomid species was recorded in the project area. In the feeding area of the nearest known colony in the cave "Supajin - Ine" the diversity and activity is moderate.
- A total of 19 types of hand tools were recorded. 5 species belong to an endangered category of the Greek Red List and/or the European Red List (IUCN), while all species belong to Annexes IV and/or II of the Directive 92/43/EEC.

- The dominant species in the project area was the Micro Bat (*Pipistrellus pygmaeus*), while the presence of the Nanon Bat (*Pipistrellus pipistrellus*) and the Nocturnal Bat (*Nyctalus noctula*) was significant. These species do not belong to any of the risk categories in the Greek Red Data Book (and in the IUCN list).
- In the area there was a low presence of the species of the closest recorded colony of chironomids in the cave "Supatzin - Ine" with the possibility that the colony was not fully active during the field survey.
- No disturbance effects are expected on the colony of chrysopters in the cave "Supajin - Ine" from the construction and operation of the ASPEO project and associated works, as the ASPEO is located more than 8 km and the associated works more than 4 km from the important cave/shelter located in the centre of the feeding area (as depicted in Map 5.2-1).
- Landscape change and occupation of project features in the installation area are not expected to result in significant impacts to existing chironomid fauna, and an increase in species diversity post-construction and interspecific competition is likely.
- During the construction phase, no significant disturbance of handlers feeding on the installation field is expected.
- The impacts from the possibility of the collision of the cranes with the A/C are expected to be moderate and mainly concern populations that do not belong to a risk category in the Greek Red Data Book (and in the IUCN list).
- Should post-operational monitoring reveal a significant number of handline fatalities from impacts (or barotrauma), it is proposed to take measures to reduce mortality such as increasing the minimum wind intensity for activation of the R/Vs or measures to detect handline movement and shutdown in case of approach to the swept area of the R/Vs.

5.3 Conclusions of the Existing Impact Assessment

Based on the above, for the characteristic species of SPA GR008, there is no evidence of any significant deterioration in their status as a result of the construction and operation of the project under study, especially after measures have been taken. It is therefore considered that their population and range in the area, as well as their excellent or in most cases good conservation status, will not be significantly affected.

In view of the above, it is assessed that the installation and operation of the ESPO cannot:

- Significantly reduce the extent or fragment the habitats of the SPA GR008 threatening their integrity, as well as affecting the ecological their functions.
- Significantly reduce the size or population density of the species or affect the balance between species or affect the degree of isolation their.
- To bring about changes in vital parameters that determine how the CPP works.
- Threaten the overall conservation status of bird species of SPA GR008 and bat species of BG0001032.

Based on the above, it is not considered appropriate to proceed further with the due impact assessment in the examination of the project under paragraph 4 of Article 6 of Directive 92/43/EEC (paragraph 4, article 10 of Law 4014/2011), i.e. with proposals for compensatory measures.

6 MEASURES TO DEAL WITH THE POSSIBLE EFFECTS

Although no significant impacts are anticipated from the construction and operation of the project on avifauna and their habitats, **it is proposed that precautionary mitigation measures be implemented to further reduce any potential impacts, even non-significant ones,** and ensure the integrity and conservation objectives of the conservation area (PA).

In order to minimize, mitigate or significantly avoid potential impacts from the construction and operation of the projects, it is proposed to implement the following measures by type of impact.

6.1 Bird species

6.1.1 Measures to address nuisance and displacement impacts

In order to avoid or reduce disturbance and displacement of birds during the construction phase, it is proposed to use alternative construction methods and, if necessary, sound barriers. The aim is to prevent or reduce during the construction phase **noise** or a **visual stimulus that is known to** cause or likely to cause a change in the behaviour of a bird species. It is therefore proposed that measures be taken during construction to reduce noise emissions from the construction of the plazas, the road network and the underground power transmission network to the substation. Thus, if percussion is used to use a non-metallic 'dolly' between the hammer and the guide head or a similar measure (The British Standards Institute, 2013) that is expected to sufficiently reduce noise levels at the receptor and therefore prevent or reduce a potentially significant impact (European Commission, 2020). Alternatively, instead of a percussive method, apply a technique using vibration to drive or screw the piles (continuous helical grading) into the ground.

To take measures for all construction activities, prepare a pre-construction TPEMP, which will consider noise from all construction sites, particularly from the construction of the plazas and the placement of the A/C towers. Among other things it will consider the embedding methods chosen by the contractor.

In all locations of the squares and construction sites, noise should be calculated by modelling (in the TEPEM) and appropriate measures to reduce noise emission and propagation should be proposed, such as the placement of mobile sound barriers with their dimensioning. The aim is to reduce the disturbance to the feeding habitat (even if occasional) of raptors such as the Vulture, Snake Eagle, Hawk, White-tailed Godwit and other birds.

Especially in cases where nests are detected at a distance of less than 500 m, which is considered a safe distance for noise disturbance, consider ground borne noise and vibration from construction activities. If values higher than literature limits are found, specific emission and propagation reduction measures should be taken, in accordance with the recommendations of the TEPEM, and in line with international literature.

The evaluation of the effectiveness of the sound barriers should be documented by noise modelling or measurements.

In addition, it is proposed to synchronise the works to avoid their implementation during periods sensitive for birds and to systematically wet the site to reduce dust during e a r t h w o r k s , while the

transport of materials will be carried out with covered lorries, in accordance with the provisions of the legislation.

In relation to disturbance from **lighting** of project elements and construction sites during construction should be kept to a minimum. Where this is necessary for safety reasons (such as the construction site, installations and substation), **lighting should be used that is not diffused towards the sky but directed towards the ground.** During operation the lighting shall be intermittent at an appropriate frequency and in colours that do not attract bats or insects, in accordance with the literature.

6.1.2 Measures to address impacts from loss of individuals and habitat degradation

A special effort has been made to ensure that the new roads allow the wind turbines to be transported with the least possible interference with the environment. This is achieved in the road design phase, taking into account the natural slopes of the terrain, the forest road specifications and the specifications of the equipment transport companies. It has been achieved that the lengths and gradients of the new roads are kept to the minimum necessary and that they are adapted to the natural topography as closely as possible.
Provision should be made for the temporary and final deposition of construction materials in suitably landscaped areas which will be located away from the feeding and living areas of the characteristic species of the area.
The excavation products, after the removal of unsuitable products, will be used, if deemed suitable, for the embankments. Efforts have been made to minimise the environmental impact and the resulting sedimentation. Based on the above, it is concluded that no additional quantities are required for the construction of the project. The removal of the plant soils will be used for slope lining and planting.
It is proposed to prohibit the uncontrolled disposal of solid and liquid waste during the construction and operation phase. Excess excavation products will be disposed of through a CCSDS to a CCS treatment facility. Construction workers' liquid waste will be collected in chemical toilets. Finally, no burning of any kind or form of material (tyres, oils, etc.) will be allowed to avoid fire risks and air pollution.

6.1.3 Measures to address the impact of fragmentation

No measures are needed as no habitat fragmentation is expected.

6.1.4 Impact mitigation measures

According to the due assessment chapter, **the significance of impacting mainly raptors and other birds on the project's A/C elements is low and the impact on populations is not significant**, therefore there is no need for additional impact measures. However, as a precautionary measure, it is proposed to systematically monitor impact losses during operation and if the above impact rate estimate is found to be systematically exceeded during the first 3 years of operation of the project, the following measures will be taken:

One of the key measures to significantly reduce impact impacts (where a critical impact is identified or estimated to occur) is to adjust the

operation of wind farms, for example by temporarily stopping the turbines when birds are nearby. Temporary curtailment is effective in preventing or reducing the risk of collision, particularly during ecologically sensitive periods (European Council, 2020). It is noted that selective shutdown can work effectively and with minimal loss in overall energy production.

Video monitoring systems: In some cases, a video-based bird monitoring and identification system is used, including a system called DtBird®106. DTBird® is a stand-alone system for monitoring birds and/or mitigating mortality at onshore and offshore wind turbine sites. This system allows monitoring of flying fauna movements near the wind turbine where it is installed and species identification after processing the collected data. The system combined with decision-making software has the possibility to take two independent actions to mitigate the risk of bird impact: to activate warning sounds and/or to stop the operation of the wind turbine (European Council, 2020).

According to the literature, the effectiveness of the selective shutdown method **can significantly reduce the mortality rate of the Vulture**.

Research on collision avoidance systems with a shutdown demonstrates a high rate of impact and fatality reduction. For example, a recent publication of a 13-year study (Ferrer et al., 2022) demonstrating a **92.8 % reduction in vulture mortality due to the implementation of the** *selective* **stopping** *protocol* and a 61.7 % reduction in *mortality of* other raptors and storks ('*After implementation of the selective stopping protocol, we found a significant reduction of 61.7 % in mortality of soaring birds (mainly raptors and storks). Considering only mortality records of Griffon Vultures, a reduction of 92.8 % was achieved*'). Similar studies also document the non-significant impact of the impact mitigation system from the displacement of species from their main habitats. **Therefore, using such a system would limit the loss of predator individuals to 0.16 vultures per year or, more precisely, 1 individual per six to seven years and 0-1 individuals of other predator species per year.** Taking into account any cumulative effects, the loss of predator individuals would be 0.32 vultures per year and 1.5 other species per year.

Therefore, **it is proposed to implement** a **DtBird or nvbird or similar system at the project A/Cs where the impact rate estimate of this study is found to be exceeded.** The selection of the deterrent system should be made by preparing an appropriate TPEMP, detailing the system and its expected effectiveness. The next figure shows a sample of in-flight bird detection from this system.

Figure 6.1-1 Detection of birds by DTBird (Atienza et al. 2014)

6.1.5 Measures to address indirect impacts

Habitat management measures are proposed to reduce the risk of collision. Such measures include reducing the availability of game birds in the wind turbine area by **removing any dead animals** in the project area and creating or enhancing habitat outside the project area to attract birds away from the turbines. It is also suggested that **providing extra food in feeders** outside the wind turbine area is also a very effective measure. Finally, restoration of any damaged nests (such as young birds) with **artificial nests** in suitable locations for the species is suggested.

6.2 Types of Handhelds

6.2.1 Impact mitigation measures

All wind turbines, and especially turbine nacelles, should be designed, constructed and maintained in such a way that they do not support their use as shelters by handbats - **all openings and gaps should be inaccessible to bats**.

Insects are attracted by the lights (security lights at the bottom of the tower (Beucher et al. 2013) and by the heat generated by some types of turbine blades (Ahlén 2002, Hensen 2004, Horn et al. 2008, Rydell et al. 2010b). Insect concentrations in areas around wind turbines therefore entice bats to hunt in these areas, and this can lead to mortalities (Kunz et al. 2007; Horn et al. 2008; Rydell et al. 2010b). The colour of wind turbines (Long et al. 2011) and some generated sounds (Kunz et al. 2007) have also been suggested as possible reasons for attracting flying insects and chironomids to the risk zone. Therefore, wind turbines and their immediate surroundings should be managed and maintained in such a way that they do not attract insects (i.e. the concentration of insects near wind turbines should be reduced as much as possible, but without affecting their abundance elsewhere in the project area).
The following measures are proposed:

- the **use of lighting that does not attract insects**,

- the use of **lighting only when necessary**, unless it is mandatory for safety reasons,
- **avoiding water retention and the growth of weeds and new bushes in the immediate area** around the construction of wind turbines (wind turbine operation zones, access roads, etc.),
- **new plant fences, other shrub and tree clusters, as well as forests and orchards, should not be allowed to be installed in** the **200 m zone** around wind turbines and such structures should not be used as compensation measures within the given distance.
- Systematic monitoring of handpiece losses during operation. If a number of losses are identified that may have a significant impact on chironomid populations, install a chironomid detection and shutdown system (similar to that for predators) in cases of high concentrations. The selection of the deterrent system should be made through the preparation of an appropriate TEMP, detailing the system and its expected effectiveness.

6.2.2 Measures to address nuisance and displacement impacts

Disturbance to foraging and movement should be prevented by limiting as far as possible some construction work during periods of the 24-hour period when bats are active (construction should generally be planned for daytime). In any case, no lighting should be used except for safety reasons, but always in compliance with the above-mentioned conditions.

6.2.3 Measures to address the impact of fragmentation

No measures are needed as no habitat fragmentation is expected.

7 COMPENSATORY MEASURES

As stated above (Section 5.4 of this EIA), the construction and operation of the project under consideration does not give rise to the need for compensatory measures.

8 MONITORING PROGRAMME

The process of environmental monitoring refers to the systematic periodic measurement of key indicators for different parameters of the EIS under study that may be affected by the construction and operation activities of the project. The implementation of the proposed monitoring programme will contribute to:

• compliance with the environmental conditions and measures of the project and therefore the preservation of the integrity of the site.

• to provide important information for the evaluation of the effectiveness of the proposed measures and conditions, depending on the trends in the evolution of the monitored parameters and their expected changes.

• early notification of potential problems and addressing them at an early stage, reducing environmental and economic costs and the scale of necessary interventions.

• the creation of an important database of scientific information on the status of the benthic fauna and the species that inhabit the area, which can be used as a tool in any decision-making process of the competent authorities for the area.

For the implementation of a monitoring programme, it is a prerequisite that baseline data or predefined reference values are available in order to better evaluate the monitoring data and thus the implemented mitigation measures.

In the case of the project under study, the baseline data obtained from the fieldwork carried out as part of this Special Ecological Assessment (SEA) will be utilised.

The proposed indicators, the general objectives and the frequency of monitoring per environmental parameter are summarised **in the following table,** while the methodology for monitoring the indicators is presented in more detail in the following paragraphs.

Particular emphasis will be given to the bird species of Annex I of Directive 2009/147/EC, to the species of ungulates of Annex II of Directive 92/43/EEC, as well as to the endangered species of the Red Book of Greece, which are found within the protected area, according to the results of the present EIA.

Field monitoring activities will be carried out in the CIP of this ERA to ensure optimal comparison with the baseline data and recording of any changes, as well as sufficient correlation between the measured parameters.

Finally, it is recommended that field monitoring of avifauna and manatees should preferably be carried out by the same experts, if possible, in order to ensure the application of comparable methods and techniques and to minimise observer bias. This need is of course reduced (without losing its importance, if it is possible to apply it) when electronic equipment (e.g. call recording microphones, cameras) is used in the recordings.

Table 6.2-1 Monitoring programme

Environmental Parameter	Index	Objectives	Project phase frequency	Measurement
NATURAL LIVING ENVIRONMENT	*Loss of birds and bats*	Survey for dead birds and bats at the site of the project and associated works	Function	Monthly field surveys for any dead birds and bats during operation for 3 years
NATURAL LIVING ENVIRONMENT	*Birdlife*	1. Document potential changes in the size, density, and passage rate of populations of important bird species in the CIP during project construction and operation relative to the baseline data in this EIS. 2. Evaluation of the data in relation to the Satisfactory Reference Values and Conservation Objectives for these species at national level to be reflected in the forthcoming Reporting Reports on the implementation of Directive 92/43/EEC.	Construction Operation	Continuous monitoring of the collision avoidance system. Monthly field surveys for any dead birds. Seasonal measurements during and outside the breeding season (4 per year)
NATURAL BIOTIC ENVIRONMENT	*Habitat*	Identification of a possible reduction in area ή aggravation of quality of habitats from various causes	Function	Once a year, for three consecutive years
PHYSICAL ABIOTIC ENVIRONMENT - SOIL	*Manage solid waste*	1. Control of compliance with environmental conditions and measures of the project during construction that concerning excavation waste but also waste from site machinery and workers 2. Protecting the soil from erosion, pollution or covering by earthquakes	Construction	Seasonal (4 times/year)

8.1 Proposed monitoring indicators

8.1.1 Index of Loss of Birds and Bats

Description. It is a species mortality monitoring indicator, i.e., the survey for dead birds and bats on the project site and associated projects.

Objectives. The main objective of the monitoring is to investigate the potential for birds and any bats to impact the project sites.

Methodology. Visual searches for dead birds tend to be most effective in bright light conditions, with a light breeze that can move feathers and down of dead birds, making them more visible, especially when it has not rained recently (rain tends to make feathers stick together). Dead bird searches should be carried out regularly on a monthly basis for the first 3 years of operation. The order of visits should be the same on each iteration so that the sampling interval is the same for each wind turbine. For each dead bird or bat found, the following data shall be recorded:

- The date and time it was found.
- The extent and type of trauma received (if identifiable).
- The species (or the best estimate for the species if it is in very poor condition and cannot be fully identified).

- The coordinates of the location where the dead animal was found (to be used for control/verification purposes).
- Digital photograph of the dead animal at the place where it was found.

8.1.2 Index of avifauna

Description. It is an indicator for monitoring important elements of the natural environment of the study area and concerns the species of avifauna listed in Annex I of Directive 2009/147/EC, as well as the endangered species of the Red Book of Greece that are found within the Research Field Area (RIF) of the present ERA. Monitoring of this indicator will utilize baseline data from the EIA fieldwork collected and assessed prior to project construction in the SPA where the project falls.

Objectives.

- Document potential changes in the size, density, and passage rate of populations of important bird species in the CIP during project construction and operation relative to the baseline data in this EIS.
- Assessment of data against the nationally satisfactory reference values and conservation objectives for the species to be reflected in the National Reporting Reports implementing Directive 92/43/EEC.
- If exceedances are found in relation to the estimates in this report, additional measures, such as a detection and shutdown system, will be taken.

Methodology. The monitoring methodology for the proposed indicator will involve, in principle, visual observation in the field (line transects, point counts, look-and-see, stopover counts, passage migration counts, etc.) using special equipment (binoculars, telescope, calling devices). In areas that support significant breeding populations according to the EEA baseline data and outside the breeding season, monitoring should be carried out using the same methods as those used for the collection of the baseline data. Also, in addition to visual observation within the EEZ during project operation, direct mortality potentially caused by the wind turbines will be recorded by visual observation of dead birds around the squares of the installed wind turbines and by using new technologies (radar and thermal cameras) which are more accurate monitoring methods in areas of importance for avifauna in the judgement of the study team experts. The fieldwork should cover at least three years of the breeding season in order to identify any potential impacts from the operation of the AGs, taking into account the natural variation of populations between years and to distinguish between short-term and long-term impacts. If the results show a significant problem with inter-annual variation, then additional surveys should be carried out to investigate longer-term effects (e.g. repeat surveys after 5 years).

A field survey for any dead birds from impact should be conducted monthly.

Investigations may need to be extended/expanded in the case of increased mortality in order to evaluate the response measures that have been implemented. Data will be stored on specific forms and then digitally stored in the corresponding descriptive and spatial indicator database maintained under the responsibility of the project promoter.

The data will be compared with the baseline data of this ERA. In case deviations from the above-mentioned constants for the EMS are found, appropriate additional mitigation and/or prevention measures will be taken.

8.1.3 Handicap index

Description. This indicator is concerned with monitoring the population of chironomids in the project CIP with a focus on important species in the area. The monitoring of this indicator will utilize baseline data from EIA fieldwork collected and assessed prior to project construction in the Natura area where the project falls.

Objectives. The main objective of the monitoring is to detect possible population declines of the cephalopod species or changes in their behaviour, as well as possible incidents of collision. If any exceedances are found relative to current estimates, additional measures such as a detection and shutdown system will be implemented.

Methodology. The methodology involves the recording of species by placing specific recording devices at specific locations in the study area. This method is based on the recording of calls (usually ultrasonic) of localization and social calls emitted by the handbirds during flight. The analysis of the sequences collected will be carried out with appropriate software.

8.1.4 Habitat index

Description. The indicator relates to monitoring the evolution of habitats in the project CIP. The extent of individual habitats that are important for the characteristic species of birds in the area should be recorded per year.
Objectives. The main objective of the monitoring is to identify any potential reduction in the extent or deterioration of habitat quality from various causes (and not necessarily only from the operation of the project) that are important for birds, so that protective measures can be taken in time to protect birds.
Methodology. The methodology involves visual field observation in the field of the habitats and their mapping. Monitoring and recording will be done once a year for three consecutive years and will be kept in the site database.

8.1.5 Solid waste management indicator

Description. The indicator concerns the monitoring of the soil condition during the construction phase of the project within the MPA and the monitoring of compliance with the measures and environmental conditions of the project. That is, it should be monitored during construction whether the final disposal of excavated soil or solid waste is carried out in the intended areas, whether the excavations are as planned, whether the planted land is kept and reused, etc.

Objectives. The main objective of the monitoring is to protect the soil from potential erosion, pollution or cover from landfill during the construction phase within the protected area, and from the disposal of liquid and solid waste from construction equipment, transport and site workers.

Methodology. The methodology includes visual field observation in the field of construction works. The data will be stored on special forms and then

digitally in the corresponding descriptive and spatial database of the indicator to be maintained under the responsibility of the project promoter.

The frequency of inspections may be seasonal with 4 recordings per year. In addition, both during construction and operation, the behaviour of soil formations, especially on the higher slopes of the road network, should be systematically monitored to ensure that they are always stable.

8.2 Data Collection - Processing - Evaluation

The effectiveness of a monitoring programme lies in the reliability and timeliness of the data and the conclusions drawn from it. The primary data from the specific field forms will be collected and also entered digitally into the programme database and a schedule of monitoring activities will be kept. The database will be structured in a suitable way to cover all fields of monitoring and to allow for spatial presentation of the data and its processing.
The proposed programme will be in line with the principles of the Environmental Management Plan according to the ISO 14001-2015 environmental quality systems standards. In this context, it is proposed that an annual report-report be prepared by an environmental consultancy firm or an expert ornithologist summarizing the results of the monitoring programme under the responsibility of the project promoter, which will be sent to the relevant departments of the central or decentralized administration for information and confirmation of compliance with environmental conditions. The correct implementation of the programme and monitoring of compliance with all the procedures laid down shall be the responsibility of the project promoter.

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10 ANNEX

10.1 RECORDING PROTOCOLS

10.1.1 VP method for predators March

Field data protocol for raptor monitoring																
Date: 24/3/2023			Area code: POLEMISTIS								VP No: 1					
Observers: Dimitrios Voulgaris									Starting hour: 9:14						Ending hour: 12:14	
Wind: 1 NORTH *(0 -3) + direction*			Cloudiness: 0 *(0-4)*		Visibility: VG *(B,M,G,VG)*				Temperature: 8					Cause for interruption:		
G.E. Id.	**ID**	**Hour**	**Species**	**Nº indiv.**	**Sex**	**Age**	**A1**	**A2**	**Flight height (m)**		**B**	**HF type**	**Mig**	**Terr**	**Ha**	**distance**	**Comments**
1	1	10:24	*Buteo buteo*	1			GL	L	50	0	EMF				HA	1130	
2	2	11:08	*Buteo buteo*	2			GL	S	80	80						1030	
3	3	11:19	*Buteo buteo*	1			GL		100							490	
4	4	11:37	*Buteo buteo*	2			GL	L	50	0						950	
1	5	12:10	*Gyps fulvus*	4			GL		200							1000	
	6																
	7																
	8																
	9																
	10																
	11																

	12															
	13															
	14															
	15															

Cloudiness: 0% / 1-15% / 16-50% / 51-75% / 76-100%	Visibility: Bad **B**, Medium **M**, Good **G**, Very Good **VG**	Sex: Female **F**, Male **M**, Pair(?) **P/P?**, Family **Fam**
Age: Juvenile **JUV**, Immature **IMM**, Sub-adult **SUBAD**, Adult **ADU**, Unknown **U**	-	
Activity A:Soaring **S**,Flying **F**,Gliding **GL**,Display **D,** Landing **L**,Take off **TOF**,Flying away **AW**,Carrying food **CF**,Mobbing intraspecific **Ma**,Mobbing interspecific **Mb**,Calling **CA**,Perching **PE**, Carrying nest material **CNM**, Family flight **FF**, Meeting Point **MP,** Nesting **N,** Copula **COP**		
Activity B: Early morning flight **EMF**, Hunting flight **HF**, Non hunting flight **NHF**, Unknown **U**, Roosting **R**		
Migration: Local **LOC(?)** *(permanent)*, Migration **MIG (?)** *(just passing by)*, Summering **SUM**, Wintering **WIN** *(migrates, stays but not breeds here)*		
HF type: *(Hunting flight type)* Hovering **HOV**, Diving **DIV**, Flapping **FL**, Hanging **HAN**, Landing **L**, Perching and flying **PF**, Soaring **S**		Distance: From Google earth
HA: Hot area **HA**, Possible nest-site **PNS**, Nest-site **NS**, Nest **NEST**		

Field data protocol for raptor monitoring

Date: 24/3/2023	Area code: POLEMISTIS	VP No: 2	
Observers: Dimitrios Voulgaris	Starting hour: 13:02		Ending hour: 16:02
Wind: 1 NORTH *(0 -3) + direction*	Cloudiness: 0 *(0-4)*	Visibility: VG *(B,M,G,VG)*	Temperature: 11	Cause for interruption:

G.E. Id.	ID	Hour	Species	Nº indiv.	Sex	Age	A 1	A 2	Flight height (m)		B	HF type	Mig	Terr	Ha	distance	Comments
5	1	14:10	*Buteo buteo*	1			GL		40							540	
6	2	15:28	*Buteo buteo*	1			GL	CA	50	50						1600	

1	3	15:39	*Accipiter nisus*	1			GL	L	50	0					HA	800	
	4																
	5																
	6																
	7																
	8																
	9																
	10																
	11																
	12																
	13																
	14																
	15																

Cloudiness: 0% / 1-15% / 16-50% / 51-75% / 76-100%	Visibility: Bad **B**, Medium **M**, Good **G**, Very Good **VG**	Sex: Female **F**, Male **M**, Pair(?) **P/P?**, Family **Fam**
Age: Juvenile **JUV**, Immature **IMM**, Sub-adult **SUBAD**, Adult **ADU**, Unknown **U**		
Activity A:Soaring **S**,Flying **F**,Gliding **GL**,Display **D,** Landing **L**,Take off **TOF**,Flying away **AW**,Carrying food **CF**,Mobbing intraspecific **Ma**,Mobbing interspecific **Mb**,Calling **CA**,Perching **PE**, Carrying nest material **CNM**, Family flight **FF**, Meeting Point **MP,** Nesting **N,** Copula **COP**		
Activity B: Early morning flight **EMF**, Hunting flight **HF**, Non hunting flight **NHF**, Unknown **U**, Roosting **R**		
Migration: Local **LOC(?)** *(permanent)*, Migration **MIG (?)** *(just passing by)*, Summering **SUM**, Wintering **WIN** *(migrates, stays but not breeds here)*		
HF type: *(Hunting flight type)* Hovering **HOV**, Diving **DIV**, Flapping **FL**, Hanging **HAN**, Landing **L**, Perching and flying **PF**, Soaring **S**		Distance: From Google earth
HA: Hot area **HA**, Possible nest-site **PNS**, Nest-site **NS**, Nest **NEST**		

Field data protocol for raptor monitoring

Date: 25/3/2023			Area code: POLEMISTIS						VP No: 1								
Observers: Dimitrios Voulgaris									Starting hour: 12:16							Ending hour: 15:16	
Wind: 1 NORTH *(0 -3) + direction*			Cloudiness: 0 *(0-4)*			Visibility: VG *(B,M,G,VG)*			Temperature: 13							Cause for interruption:	
G.E. Id.	**ID**	**Hour**	**Species**	**Nº indiv.**	**Sex**	**Age**	**A1**	**A2**	**Flight height (m)**		**B**	**HF type e**	**Mig**	**Terr**	**Ha**	**distance**	**Comments**
7	1	12:33	*Buteo buteo*	2			GL		50							900	
8	2	13:21	*Buteo buteo*	1			GL	CA	100	100						1640	
9	3	14:05	*Buteo buteo*	1			GL	CA	30	30						1130	
1	4	14:19	*Circaetus gallicus*	1		ADU	GL		50							1200	
	5																
	6																
	7																
	8																
	9																
	10																
	11																
	12																
	13																

	14																
	15																

Cloudiness: 0% / 1-15% / 16-50% / 51-75% / 76-100%	Visibility: Bad **B**, Medium **M**, Good **G**, Very Good **VG**	Sex: Female **F**, Male **M**, Pair(?) **P/P?**, Family **Fam**
Age: Juvenile **JUV**, Immature **IMM**, Sub-adult **SUBAD**, Adult **ADU**, Unknown **U**		
Activity A:Soaring **S**,Flying **F**,Gliding **GL**,Display **D,** Landing **L**,Take off **TOF**,Flying away **AW**,Carrying food **CF**,Mobbing intraspecific **Ma**,Mobbing interspecific **Mb**,Calling **CA**,Perching **PE**, Carrying nest material **CNM**, Family flight **FF**, Meeting Point **MP,** Nesting **N,** Copula **COP**		
Activity B: Early morning flight **EMF**, Hunting flight **HF**, Non hunting flight **NHF**, Unknown **U**, Roosting **R**		
Migration: Local **LOC(?)** *(permanent)*, Migration **MIG (?)** *(just passing by)*, Summering **SUM**, Wintering **WIN** *(migrates, stays but not breeds here)*		
HF type: *(Hunting flight type)* Hovering **HOV**, Diving **DIV**, Flapping **FL**, Hanging **HAN**, Landing **L**, Perching and flying **PF**, Soaring **S**		Distance: from Google earth
HA: Hot area **HA**, Possible nest-site **PNS**, Nest-site **NS**, Nest **NEST**		

Field data protocol for raptor monitoring

Date: 25/3/2023	Area code: POLEMISTIS	VP No: 2	
Observers: Dimitrios Voulgaris	Starting hour: 8:44		Ending hour: 11:44
Wind: 1 NORTH *(0 -3) + direction*	Cloudiness: 0 *(0-4)*	Visibility: VG *(B,M,G,VG)*	Temperature: 7	Cause for interruption:

G.E. Id.	ID	Hour	Species	Nº indiv.	Sex	Age	A1	A2	Flight height (m)		B	HF type	Mig	Terr	Ha	distance	Comments
2	1	10:12	*Accipiter nisus*	1			S	GL	50	50					HA	920	
	2																
	3																
	4																

	5															
	6															
	7															
	8															
	9															
	10															
	11															
	12															
	13															
	14															
	15															

Cloudiness: 0% / 1-15% / 16-50% / 51-75% / 76-100%	Visibility: Bad **B**, Medium **M**, Good **G**, Very Good **VG**	Sex: Female **F**, Male **M**, Pair(?) **P/P?**, Family **Fam**
Age: Juvenile **JUV**, Immature **IMM**, Sub-adult **SUBAD**, Adult **ADU**, Unknown **U**		
Activity A:Soaring **S**,Flying **F**,Gliding **GL**,Display **D,** Landing **L**,Take off **TOF**,Flying away **AW**,Carrying food **CF**,Mobbing intraspecific **Ma**,Mobbing interspecific **Mb**,Calling **CA**,Perching **PE**, Carrying nest material **CNM**, Family flight **FF**, Meeting Point **MP,** Nesting **N,** Copula **COP**		
Activity B: Early morning flight **EMF**, Hunting flight **HF**, Non hunting flight **NHF**, Unknown **U**, Roosting **R**		
Migration: Local **LOC(?)** *(permanent)*, Migration **MIG (?)** *(just passing by)*, Summering **SUM**, Wintering **WIN** *(migrates, stays but not breeds here)*		
HF type: *(Hunting flight type)* Hovering **HOV**, Diving **DIV**, Flapping **FL**, Hanging **HAN**, Landing **L**, Perching and flying **PF**, Soaring **S**		Distance: from Google earth
HA: Hot area **HA**, Possible nest-site **PNS**, Nest-site **NS**, Nest **NEST**		

10.1.2 VP method for predators April

Field data protocol for raptor monitoring

Date: 29/4/2023			Area code: POLEMISTIS									VP No: 1				
Observers: Dimitrios Voulgaris									Starting hour: 8:10						Ending hour: 12:10	
Wind: 2 NORTH *(0 -3) + direction*			Cloudiness: 3 *(0-4)*			Visibility: VG *(B,M,G,VG)*			Temperature: 11						Cause for interruption:	
G.E. Id.	**ID**	**Hour**	**Species**	**Nº indiv.**	**Sex**	**Age**	**A1**	**A2**	**Flight height (m)**		**B**	**HF type**	**Mig**	**Terr**	**Ha**	**Distance**	**Comments**
1	1	10:23	*Buteo buteo*	1		ADU	TOF	GL	0	100						280	
2	2	10:51	*Buteo buteo*	2		ADU	GL		70							1000	
3	3	11:10	*Buteo buteo*	1		ADU	GL	L	50	0	HF	DIV				1370	
4	4	11:38	*Buteo buteo*	1		ADU	D	S	50	50						970	
	5																
	6																
	7																
	8																
	9																
	10																
	11																
	12																
	13																
	14																
	15																
Cloudiness: 0% / 1-15% / 16-50% / 51-75% / 76-100%						Visibility: Bad **B**, Medium **M**, Good **G**, Very Good **VG**							Sex: Female **F**, Male **M**, Pair(?) **P/P?**, Family **Fam**				
Age: Juvenile **JUV**, Immature **IMM**, Sub-adult **SUBAD**, Adult **ADU**, Unknown **U**																

Activity A:Soaring **S**,Flying **F**,Gliding **GL**,Display **D,** Landing **L**,Take off **TOF**,Flying away **AW**,Carrying food **CF**,Mobbing intraspecific **Ma**,Mobbing interspecific **Mb**,Calling **CA**,Perching **PE**, Carrying nest material **CNM**, Family flight **FF**, Meeting Point **MP,** Nesting **N,** Copula **COP**		
Activity B: Early morning flight **EMF**, Hunting flight **HF**, Non hunting flight **NHF**, Unknown **U**, Roosting **R**		
Migration: Local **LOC(?)** *(permanent)*, Migration **MIG (?)** *(just passing by)*, Summering **SUM**, Wintering **WIN** *(migrates, stays but not breeds here)*		
HF type: *(Hunting flight type)* Hovering **HOV**, Diving **DIV**, Flapping **FL**, Hanging **HAN**, Landing **L**, Perching and flying **PF**, Soaring **S**	Distance: From Google earth	
HA: Hot area **HA**, Possible nest-site **PNS**, Nest-site **NS**, Nest **NEST**		

Field data protocol for raptor monitoring

Date: 29/4/2023	Area code: POLEMISTIS	VP No: 2	
Observers: Dimitrios Voulgaris	Starting hour: 12:35		Ending hour: 16:35
Wind: 2 NORTH *(0 -3) + direction*	Cloudiness: 3 *(0-4)*	Visibility: VG *(B,M,G,VG)*	Temperature: 14	Cause for interruption:

G.E. Id.	ID	Hour	Species	Nº indiv.	Sex	Age	A1	A2	Flight height (m)		B	HF type	Mig	Terr	Ha	distance	Comments
5	1	13:42	*Buteo buteo*	1			GL	F	50	50						1450	
1	2	16:14	*Accipiter nisus*	1			F	D	50	50						520	
	3																
	4																
	5																
	6																
	7																
	8																
	9																

	10															
	11															
	12															
	13															
	14															
	15															

Cloudiness: 0% / 1-15% / 16-50% / 51-75% / 76-100%	Visibility: Bad **B**, Medium **M**, Good **G**, Very Good **VG**	Sex: Female **F**, Male **M**, Pair(?) **P/P?**, Family **Fam**
Age: Juvenile **JUV**, Immature **IMM**, Sub-adult **SUBAD**, Adult **ADU**, Unknown **U**		
Activity A:Soaring **S**,Flying **F**,Gliding **GL**,Display **D,** Landing **L**,Take off **TOF**,Flying away **AW**,Carrying food **CF**,Mobbing intraspecific **Ma**,Mobbing interspecific **Mb**,Calling **CA**,Perching **PE**, Carrying nest material **CNM**, Family flight **FF**, Meeting Point **MP,** Nesting **N,** Copula **COP**		
Activity B: Early morning flight **EMF**, Hunting flight **HF**, Non hunting flight **NHF**, Unknown **U**, Roosting **R**		
Migration: Local **LOC(?)** *(permanent)*, Migration **MIG (?)** *(just passing by)*, Summering **SUM**, Wintering **WIN** *(migrates, stays but not breeds here)*		
HF type: *(Hunting flight type)* Hovering **HOV**, Diving **DIV**, Flapping **FL**, Hanging **HAN**, Landing **L**, Perching and flying **PF**, Soaring **S**		Distance: from Google earth
HA: Hot area **HA**, Possible nest-site **PNS**, Nest-site **NS**, Nest **NEST**		

Field data protocol for raptor monitoring

Date: 30/4/2023	Area code: POLEMISTIS		VP No: 1	
Observers: Dimitrios Voulgaris			Starting hour: 12:50	Ending hour: 16:50
Wind: 1 SOUTH *(0 -3) + direction*	Cloudiness: 4 *(0-4)*	Visibility: VG *(B,M,G,VG)*	Temperature: 15	Cause for interruption:

G.E. Id.	ID	Hour	Species	Nº indiv.	Sex	Age	A1	A2	Flight height (m)		B	HF type	Mig	Terr	Ha	Distance	Comments
7	1	12:51	*Buteo buteo*	1			S	GL	60	60	HF	DIV				970	
2	2	15:21	*Accipiter nisus*	1			F		10		HF	DIV				200	
3	3	15:39	*Accipiter nisus*	1			D	F	20							700	
	4																
	5																
	6																
	7																
	8																
	9																
	10																
	11																
	12																
	13																
	14																
	15																

Cloudiness: 0% / 1-15% / 16-50% / 51-75% / 76-100%

Visibility: Bad **B**, Medium **M**, Good **G**, Very Good **VG**

Sex: Female **F**, Male **M**, Pair(?) **P/P?**, Family **Fam**

Age: Juvenile **JUV**, Immature **IMM**, Sub-adult **SUBAD**, Adult **ADU**, Unknown **U**

Activity A:Soaring **S**,Flying **F**,Gliding **GL**,Display **D,** Landing **L**,Take off **TOF**,Flying away **AW**,Carrying food **CF**,Mobbing intraspecific **Ma**,Mobbing interspecific **Mb**,Calling **CA**,Perching **PE**, Carrying nest material **CNM**, Family flight **FF**, Meeting Point **MP,** Nesting **N,** Copula **COP**

Activity B: Early morning flight **EMF**, Hunting flight **HF**, Non hunting flight **NHF**, Unknown **U**, Roosting **R**

Migration: Local **LOC(?)** *(permanent)*, Migration **MIG (?)** *(just passing by)*, Summering **SUM**, Wintering **WIN** *(migrates, stays but not breeds here)*

HF type: *(Hunting flight type)* Hovering **HOV**, Diving **DIV**, Flapping **FL**, Hanging **HAN**, Landing **L**, Perching and flying **PF**, Soaring **S**

Distance: From Google earth

HA: Hot area **HA**, Possible nest-site **PNS**, Nest-site **NS**, Nest **NEST**

Field data protocol for raptor monitoring

Date: 30/4/2023	Area code: POLEMISTIS	VP No: 2	
Observers: Dimitrios Voulgaris		Starting hour: 8:26	Ending hour: 12:26
Wind: 1 SOUTH *(0 -3) + direction*	Cloudiness: 4 *(0-4)*	Visibility: VG *(B,M,G,VG)*	Temperature: 13	Cause for interruption:

G.E. Id.	ID	Hour	Species	Nº indiv.	Sex	Age	A1	A2	Flight height (m)		B	HF type	Mig	Terr	Ha	Distance	Comments
6	1	9:39	*Buteo buteo*	1			F	GL	100		EMF					920	
	2																
	3																
	4																
	5																
	6																
	7																
	8																
	9																
	10																
	11																
	12																
	13																
	14																
	15																

Cloudiness: 0% / 1-15% / 16-50% / 51-75% / 76-100%

Visibility: Bad **B**, Medium **M**, Good **G**, Very Good **VG**

Sex: Female **F**, Male **M**, Pair(?) **P/P?**, Family **Fam**

Age: Juvenile **JUV**, Immature **IMM**, Sub-adult **SUBAD**, Adult **ADU**, Unknown **U**

Activity A:Soaring **S**,Flying **F**,Gliding **GL**,Display **D,** Landing **L**,Take off **TOF**,Flying away **AW**,Carrying food **CF**,Mobbing intraspecific **Ma**,Mobbing interspecific **Mb**,Calling **CA**,Perching **PE**, Carrying nest material **CNM**, Family flight **FF**, Meeting Point **MP,** Nesting **N,** Copula **COP**

Activity B: Early morning flight **EMF**, Hunting flight **HF**, Non hunting flight **NHF**, Unknown **U**, Roosting **R**		
Migration: Local **LOC(?)** *(permanent)*, Migration **MIG (?)** *(just passing by)*, Summering **SUM**, Wintering **WIN** *(migrates, stays but not breeds here)*		
HF type: *(Hunting flight type)* Hovering **HOV**, Diving **DIV**, Flapping **FL**, Hanging **HAN**, Landing **L**, Perching and flying **PF**, Soaring **S**		Distance: from Google earth
HA: Hot area **HA**, Possible nest-site **PNS**, Nest-site **NS**, Nest **NEST**		

10.1.3 VP method for predators May

10.1.4 VP method for predators June

Field data protocol for raptor monitoring

Date: 24/6/2023			Area code: POLEMISTIS									VP No: 1				
Observers: Dimitrios Voulgaris										Starting hour: 14:16					Ending hour: 18:16	
Wind: 1 North *(0 -3) + direction*			Cloudiness: 0 *(0-4)*		Visibility: VG *(B,M,G,VG)*					Temperature: 26					Cause for interruption:	
G.E. Id.	**ID**	**Hour**	**Species**	**Nº indiv.**	**Sex**	**Age**	**A1**	**A2**	**Flight height (m)**		**B**	**HF type**	**Mig**	**Terr**	**Ha**	**Distance**	**Comments**
5	1	14:26	*Buteo buteo*	1			PE	TOF	10	10	HF	PF				135	
1	2	14:45	*Circ. gallicus*	1		IMM	TOF	S	0	50	HF	PF				290	
6	3	15:43	*Buteo buteo*	1		ADU	GL		50							500	
7	4	16:12	*Buteo buteo*	2	P	ADU	S		80						HA	820	
8	5	17:34	*Buteo buteo*	1			F	GL	50	50						1500	
	6																

	7															
	8															
	9															
	10															
	11															
	12															
	13															
	14															
	15															

Cloudiness: 0% / 1-15% / 16-50% / 51-75% / 76-100%	Visibility: Bad **B**, Medium **M**, Good **G**, Very Good **VG**	Sex: Female **F**, Male **M**, Pair(?) **P/P?**, Family **Fam**
Age: Juvenile **JUV**, Immature **IMM**, Sub-adult **SUBAD**, Adult **ADU**, Unknown **U**		
Activity A:Soaring **S**,Flying **F**,Gliding **GL**,Display **D,** Landing **L**,Take off **TOF**,Flying away **AW**,Carrying food **CF**,Mobbing intraspecific **Ma**,Mobbing interspecific **Mb**,Calling **CA**,Perching **PE**, Carrying nest material **CNM**, Family flight **FF**, Meeting Point **MP,** Nesting **N,** Copula **COP**		
Activity B: Early morning flight **EMF**, Hunting flight **HF**, Non hunting flight **NHF**, Unknown **U**, Roosting **R**		
Migration: Local **LOC(?)** *(permanent)*, Migration **MIG (?)** *(just passing by)*, Summering **SUM**, Wintering **WIN** *(migrates, stays but not breeds here)*		
HF type: *(Hunting flight type)* Hovering **HOV**, Diving **DIV**, Flapping **FL**, Hanging **HAN**, Landing **L**, Perching and flying **PF**, Soaring **S**		Distance: from Google earth
HA: Hot area **HA**, Possible nest-site **PNS**, Nest-site **NS**, Nest **NEST**		

Field data protocol for raptor monitoring

Date: 24/6/2023			Area code: POLEMISTIS								VP No: 2					
Observers: Dimitrios Voulgaris									Starting hour: 9:29						Ending hour: 13:31	
Wind: No wind *(0 -3) + direction*			Cloudiness: 0 *(0-4)*			Visibility: VG *(B,M,G,VG)*			Temperature: 24					Cause for interruption:		
G.E. Id.	**ID**	**Hour**	**Species**	**Nº indiv.**	**Sex**	**Age**	**A1**	**A2**	**Flight height (m)**	**B**	**HF type**	**Mig**	**Terr**	**Ha**	**Distance**	**Comments**

1	1	10:25	*Buteo buteo*	1		Adult	GL		30							1150	
2	2	11:07	*Buteo buteo*	1		Adult	S	GL	80	50						550	
3	3	11:47	*Buteo buteo*	1		Adult	TOF	S	0	70						550	
4	4	12:32	*Buteo buteo*	2	Pair	Adult	S	D	100	100				V	Ha	1380	
	5																
	6																
	7																
	8																
	9																
	10																
	11																
	12																
	13																
	14																
	15																

Cloudiness: 0% / 1-15% / 16-50% / 51-75% / 76-100%

Visibility: Bad **B**, Medium **M**, Good **G**, Very Good **VG**

Sex: Female **F**, Male **M**, Pair(?) **P/P?**, Family **Fam**

Age: Juvenile **JUV**, Immature **IMM**, Sub-adult **SUBAD**, Adult **ADU**, Unknown **U**

Activity A:Soaring **S**,Flying **F**,Gliding **GL**,Display **D,** Landing **L**,Take off **TOF**,Flying away **AW**,Carrying food **CF**,Mobbing intraspecific **Ma**,Mobbing interspecific **Mb**,Calling **CA**,Perching **PE**, Carrying nest material **CNM**, Family flight **FF**, Meeting Point **MP,** Nesting **N,** Copula **COP**

Activity B: Early morning flight **EMF**, Hunting flight **HF**, Non hunting flight **NHF**, Unknown **U**, Roosting **R**

Migration: Local **LOC(?)** *(permanent)*, Migration **MIG (?)** *(just passing by)*, Summering **SUM**, Wintering **WIN** *(migrates, stays but not breeds here)*

HF type: *(Hunting flight type)* Hovering **HOV**, Diving **DIV**, Flapping **FL**, Hanging **HAN**, Landing **L**, Perching and flying **PF**, Soaring **S**

Distance: from Google earth

HA: Hot area **HA**, Possible nest-site **PNS**, Nest-site **NS**, Nest **NEST**

Field data protocol for raptor monitoring

Date: 25/6/2023	Area code: POLEMISTIS	VP No: 1	

Observers: Dimitrios Voulgaris															Starting hour: 8:37				Ending hour: 12:37
Wind: 3 North *(0 -3) + direction*			Cloudiness: 0 *(0-4)*			Visibility: VG *(B,M,G,VG)*									Temperature: 20				Cause for interruption:
G.E. Id.	**ID**	**Hour**	**Species**	**Nº indiv.**	**Sex**	**Age**	**A1**	**A2**	**Flight height (m)**		**B**	**HF type**	**Mig**	**Terr**	**Ha**	**Distance**	**Comments**		
9	1	9:05	*Buteo buteo*	1		ADULT	S		50		EMF					1130			
10	2	11:31	*Buteo buteo*	1		ADULT	GL		30							460			
	3																		
	4																		
	5																		
	6																		
	7																		
	8																		
	9																		
	10																		
	11																		
	12																		
	13																		
	14																		
	15																		

Cloudiness: 0% / 1-15% / 16-50% / 51-75% / 76-100%

Visibility: Bad **B**, Medium **M**, Good **G**, Very Good **VG**

Sex: Female **F**, Male **M**, Pair(?) **P/P?**, Family **Fam**

Age: Juvenile **JUV**, Immature **IMM**, Sub-adult **SUBAD**, Adult **ADU**, Unknown **U**

Activity A:Soaring **S**,Flying **F**,Gliding **GL**,Display **D,** Landing **L**,Take off **TOF**,Flying away **AW**,Carrying food **CF**,Mobbing intraspecific **Ma**,Mobbing interspecific **Mb**,Calling **CA**,Perching **PE**, Carrying nest material **CNM**, Family flight **FF**, Meeting Point **MP,** Nesting **N,** Copula **COP**

Activity B: Early morning flight **EMF**, Hunting flight **HF**, Non hunting flight **NHF**, Unknown **U**, Roosting **R**

Migration: Local **LOC(?)** *(permanent)*, Migration **MIG (?)** *(just passing by)*, Summering **SUM**, Wintering **WIN** *(migrates, stays but not breeds here)*

HF type: *(Hunting flight type)* Hovering **HOV**, Diving **DIV**, Flapping **FL**, Hanging **HAN**, Landing **L**, Perching and flying **PF**, Soaring **S**

Distance: from Google earth

HA: Hot area **HA**, Possible nest-site **PNS**, Nest-site **NS**, Nest **NEST**

Field data protocol for raptor monitoring

Date: 25/6/2023	Area code: POLEMISTIS	VP No: 2	
Observers: Dimitrios Voulgaris		Starting hour: 13:09	Ending hour: 17:09
Wind: 3 North *(0 -3) + direction*	Cloudiness: 0 *(0-4)*	Visibility: VG *(B,M,G,VG)*	Temperature: 25	Cause for interruption:

G.E. Id.	ID	Hour	Species	Nº indiv.	Sex	Age	A 1	A 2	Flight height (m)		B	HF type e	Mig	Terr	Ha	distance	Comments
11	1	15:42	*Buteo buteo*	1		ADULT	GL		100							1300	
1	2	16:12	*Accipiter nisus*	1	FEM	ADULT	S		50							680	
12	3	16:44	*Buteo buteo*	1		ADULT	F	S	50	100						1050	
	4																
	5																
	6																
	7																
	8																
	9																
	10																
	11																

	12															
	13															
	14															
	15															

Cloudiness: 0% / 1-15% / 16-50% / 51-75% / 76-100%	Visibility: Bad **B**, Medium **M**, Good **G**, Very Good **VG**	Sex: Female **F**, Male **M**, Pair(?) **P/P?**, Family **Fam**
Age: Juvenile **JUV**, Immature **IMM**, Sub-adult **SUBAD**, Adult **ADU**, Unknown **U**		
Activity A:Soaring **S**,Flying **F**,Gliding **GL**,Display **D,** Landing **L**,Take off **TOF**,Flying away **AW**,Carrying food **CF**,Mobbing intraspecific **Ma**,Mobbing interspecific **Mb**,Calling **CA**,Perching **PE**, Carrying nest material **CNM**, Family flight **FF**, Meeting Point **MP,** Nesting **N,** Copula **COP**		
Activity B: Early morning flight **EMF**, Hunting flight **HF**, Non hunting flight **NHF**, Unknown **U**, Roosting **R**		
Migration: Local **LOC(?)** *(permanent)*, Migration **MIG (?)** *(just passing by)*, Summering **SUM**, Wintering **WIN** *(migrates, stays but not breeds here)*		
HF type: *(Hunting flight type)* Hovering **HOV**, Diving **DIV**, Flapping **FL**, Hanging **HAN**, Landing **L**, Perching and flying **PF**, Soaring **S**		Distance: from Google earth
HA: Hot area **HA**, Possible nest-site **PNS**, Nest-site **NS**, Nest **NEST**		

10.1.5 VP method for predators October

Date of	Recording method	Coordinates		Start time	End time	Kind of	Number of persons
25/10/2023	VP	630895	4567275	8:00	11:00	*chloris chloris*	3
25/10/2023	VP	630895	4567275	8:00	11:00	*Falco tinnunculus*	1
25/10/2023	VP	630895	4567275	8:00	11:00	*Columba palumbus*	7
25/10/2023	VP	630895	4567275	8:00	11:00	*Carduelis carduelis*	3
25/10/2023	VP	630895	4567275	8:00	11:00	*corvus corone*	3
25/10/2023	VP	630895	4567275	8:00	11:00	*fringilla coelebs*	2
25/10/2023	VP	630895	4567275	8:00	11:00	*caudate aegithalus*	8
25/10/2023	VP	630895	4567275	8:00	11:00	*Falco tinnunculus*	1

25/10/2023	VP	630895	4567275	8:00	11:00	*Garrulus glandarius*	2
25/10/2023	VP	630895	4567275	8:00	11:00	*Columba palumbus*	5
25/10/2023	VP	630962	4572287	13:00	16:00	*Phylloscopus collybita*	2
25/10/2023	VP	630962	4572287	13:00	16:00	*Falco tinnunculus*	1
25/10/2023	VP	630962	4572287	13:00	16:00	*fringilla coelebs*	2
25/10/2023	VP	630962	4572287	13:00	16:00	*Turdus viscivorus*	4
25/10/2023	VP	630962	4572287	13:00	16:00	*Falco tinnunculus*	1
25/10/2023	VP	630962	4572287	13:00	16:00	*Columba palumbus*	8
25/10/2023	VP	630962	4572287	13:00	16:00	*Phoenicurus ochruros*	2
25/10/2023	VP	630962	4572287	13:00	16:00	*Falco tinnunculus*	1
26/10/2023	VP	630962	4572287	8:00	11:00	*Sylvia atricapilla*	1
26/10/2023	VP	630962	4572287	8:00	11:00	*Turdus viscivorus*	1
26/10/2023	VP	630962	4572287	8:00	11:00	*corvus corone*	3
26/10/2023	VP	630962	4572287	8:00	11:00	*Parus major*	1
26/10/2023	VP	630962	4572287	8:00	11:00	*Garrulus glandarius*	1
26/10/2023	VP	630962	4572287	8:00	11:00	*Turdus philomelos*	1
26/10/2023	VP	630962	4572287	8:00	11:00	*Phylloscopus collybita*	2
26/10/2023	VP	630962	4572287	8:00	11:00	*Phylloscopus collybita*	1
26/10/2023	VP	630962	4572287	8:00	11:00	*Carduelis carduelis*	2
26/10/2023	VP	630962	4572287	8:00	11:00	*fringilla coelebs*	2
26/10/2023	VP	630962	4572287	8:00	11:00	*chloris chloris*	1
26/10/2023	VP	630962	4572287	8:00	11:00	*Turdus philomelos*	4
26/10/2023	VP	630962	4572287	8:00	11:00	*chloris chloris*	1
26/10/2023	VP	630962	4572287	8:00	11:00	*Turdus merula*	3

26/10/2023	VP	630962	4572287	8:00	11:00	*Parus major*	2
26/10/2023	VP	630962	4572287	8:00	11:00	*Accipiter nisus*	1
26/10/2023	VP	630895	4567275	13:00	16:00	*Buteo buteo*	1
26/10/2023	VP	630895	4567275	13:00	16:00	*Garrulus glandarius*	2
26/10/2023	VP	630895	4567275	13:00	16:00	*Phylloscopus collybita*	1
26/10/2023	VP	630895	4567275	13:00	16:00	*Turdus merula*	2
26/10/2023	VP	630895	4567275	13:00	16:00	*Falco tinnunculus*	1
26/10/2023	VP	630895	4567275	13:00	16:00	*Accipiter nisus*	2
26/10/2023	VP	630895	4567275	13:00	16:00	*Turdus viscivorus*	2
26/10/2023	VP	630895	4567275	13:00	16:00	*Corvus corax*	4
26/10/2023	VP	630895	4567275	13:00	16:00	*Parus major*	1

10.1.6 List of observations March

a/a	Common name	Latin name	Number of people*
1	Xefteri	*Accipiter nisus*	2
2	Gerakina	*Buteo buteo*	12
3	Vulture	*Gyps fulvus*	4
4	Snake Eagle	*Circaetus gallicus*	1
5	Fassa	*Columba palumbus*	8
6	Black Woodpecker	*Dryocopus martius*	5

7	Middle Woodpecker	*Leiopicus medius*	2
8	Pinecodonculapist	*Dendrocopos major*	3
9	Nanodigger	*Dendrocopos minor*	3
10	Ascetic Woodpecker	*picus canus*	6
11	Green Woodpecker	*picus viridis*	1
12	Lefkonius woodpecker	*Dendrocopos leucotos*	2
13	Coconut Crusher	*Coccothraustes coccothraustes*	4
14	The Monk	*Parus major*	16
15	Ducky	*cyanistes caeruleus*	4
16	Chestnut trap	*poecile palustris*	2
17	Aegithalos	*Aegithalos caudatus*	7
18	Dendrochopanakos	*pitta europaea*	9
19	Cambodian	*Certhia brachydactyla*	3
20	Hoochie	*Strix aluco*	1
21	Ruffed Grouse	*Upupa epops*	1
22	Blackbird	*Turdus merula*	23
23	Gerakotsichla	*Turdus viscivorus*	16
24	Chewing gum	*Turdus philomelos*	4
25	Trees	*Lullula arborea*	2
26	Kissa	*Garullus glandarius*	10
27	Crow	*Corvus corax*	3

28	Cinderella	*corvus corone*	2
29	Finch	*fringilla coelebs*	15
30	Cardarina	*Carduellis carduellis*	4
31	Kokkinolaimi	*Erithacus rubecola*	17
32	Carbuncle	*Phoenicurus ochruros*	8
33	Woodpecker	*Troglodytes troglodytes*	4
34	Syringa	*Emberiza cirlus*	1

*Total number of individuals observed in all methods applied

10.1.7 List of observations April

a/a	Common name	Latin name	Number of people*
1.	Xefteri	*Accipiter nisus*	3
2.	Gerakina	*Buteo buteo*	8
3.	Fassa	*Columba palumbus*	12
4.	Black Woodpecker	*Dryocopus martius*	7
5.	Middle Woodpecker	*Leiopicus medius*	2
6.	Pinecodonculapist	*Dendrocopos major*	3
7.	Nanodigger	*Dendrocopos minor*	2
8.	Ascetic Woodpecker	*picus canus*	6
9.	Green Woodpecker	*picus viridis*	1
10.	Balkan Woodpecker	*Dendrocopus syriacus*	1
11.	Lefkonius woodpecker	*Dendrocopos leucotos*	1
12.	Coconut Crusher	*Coccothraustes coccothraustes*	5

13.	The Monk	*Parus major*	21
14.	Ducky	*cyanistes caeruleus*	11
15.	Chestnut trap	*poecile palustris*	5
16.	Aegithalos	*Aegithalos caudatus*	8
17.	Dendrochopanakos	*pitta europaea*	13
18.	Cambodian	*Certhia brachydactyla*	6
19.	Hoochie	*Strix aluco*	4
20.	Miltohelidon	*cecropis daurica*	4
21.	Cuckoo	*Cuculus canorus*	3
22.	Bee-eater	*Merops apiaster*	10
23.	Sycophagus	*Oriolus oriolus*	2
24.	Ruffed Grouse	*Upupa epops*	2
25.	Oak woodpecker	*Ficedula semitorquata*	4
26.	Nightingale	*Luscinia megarynchos*	3
27.	Blackbird	*Turdus merula*	14
28.	Gerakotsichla	*Turdus viscivorus*	7
29.	Chewing gum	*Turdus philomelos*	3
30.	Trees	*Lullula arborea*	2
31.	Kissa	*Garullus glandarius*	16
32.	Crow	*Corvus corax*	4
33.	Cinderella	*corvus corone*	3
34.	Bunotsirovacos	*Sylvia curuca*	4
35.	Mavroskoufis	*Sylvia atricapila*	4
36.	Dendrophylloxacos	*Phylloscopus collybita*	3
37.	Finch	*fringilla coelebs*	17

38.	Cardarina	*Carduellis carduellis*	7
39.	Kokkinolaimi	*Erithacus rubecola*	8
40.	Woodpecker	*Troglodytes troglodytes*	3
41.	Strawberry	*Emberiza hortulana*	1
42.	Syringa	*Emberiza cirlus*	9

*Total number of individuals observed in all methods applied

10.1.8 List of observations May

a/a	Common name	Latin name	Number of people*
1.	Gerakina	*Buteo buteo*	5
2.	Fassa	*Columba palumbus*	4
3.	Black Woodpecker	*Dryocopus martius*	2
4.	Pinecodonculus	*Dendrocopos major*	1
5.	Nanodigger	*Dendrocopos minor*	2
6.	Ascetic Woodpecker	*picus canus*	4
7.	Green Woodpecker	*picus viridis*	1
8.	The Monk	*Parus major*	13
9.	Ducky	*Cyanistes caeruleus*	15
10.	Chestnut trap	*poecile palustris*	2
11.	Aegithalos	*Aegithalos caudatus*	7
12.	Dendrochopanakos	*pitta europaea*	5
13.	Cambodian	*Certhia brachydactyla*	3
14.	Hoochie	*Strix aluco*	2

15.	Miltohelidon	*cecropis daurica*	4
16.	Cuckoo	*Cuculus canorus*	4
17.	Bee-eater	*Merops apiaster*	8
18.	Sycophagus	*Oriolus oriolus*	2
19.	Ruffed Grouse	*Upupa epops*	3
20.	Nightingale	*Luscinia megarynchos*	3
21.	Blackbird	*Turdus merula*	10
22.	Gerakotsichla	*Turdus viscivorus*	9
23.	Trees	*Lullula arborea*	4
24.	Kissa	*Garullus glandarius*	9
25.	Crow	*Corvus corax*	4
26.	Dendrophylloxacos	*Phylloscopus collybita*	3
27.	Finch	*fringilla coelebs*	12
28.	Cardarina	*Carduellis carduellis*	7
29.	Kokkinolaimi	*Erithacus rubecola*	6
30.	Eagle Eagle	*Lanius collurio*	4
31.	Strawberry	*Emberiza hortulana*	2
32.	Syringa	*Emberiza cirlus*	8

*Total number of individuals observed in all methods applied

10.1.9 Observations list June

a/a	Common name	Latin name	Number of people*

1.	Xefteri	*Accipiter nisus*	1
2.	Gerakina	*Buteo buteo*	14
3.	Snake Eagle	*Circaetus gallicus*	1
4.	Fassa	*Columba palumbus*	5
5.	Black Woodpecker	*Dryocopus martius*	3
6.	Middle Woodpecker	*Leiopicus medius*	1
7.	Pinecodonculapist	*Dendrocopos major*	1
8.	Nanodigger	*Dendrocopos minor*	2
9.	Ascetic Woodpecker	*picus canus*	4
10.	Green Woodpecker	*picus viridis*	1
11.	Coconut Crusher	*Coccothraustes coccothraustes*	4
12.	The Monk	*Parus major*	14
13.	Ducky	*Cyanistes caeruleus*	17
14.	Chestnut trap	*poecile palustris*	6
15.	Aegithalos	*Aegithalos caudatus*	10
16.	Dendrochopanakos	*pitta europaea*	10
17.	Cambodian	*Certhia brachydactyla*	6
18.	Hoochie	*Strix aluco*	3
19.	Miltohelidon	*cecropis daurica*	4
20.	Cuckoo	*Cuculus canorus*	5
21.	Bee-eater	*Merops apiaster*	9
22.	Sycophagus	*Oriolus oriolus*	3
23.	Ruffed Grouse	*Upupa epops*	11
24.	Nightingale	*Luscinia megarynchos*	2

25.	Blackbird	*Turdus merula*	11
26.	Gerakotsichla	*Turdus viscivorus*	13
27.	Chewing gum	*Turdus philomelos*	2
28.	Trees	*Lullula arborea*	5
29.	Kissa	*Garullus glandarius*	14
30.	Crow	*Corvus corax*	2
31.	Cinderella	*corvus corone*	2
32.	Bunotsirovacos	*Sylvia curuca*	2
33.	Dendrophylloxacos	*Phylloscopus collybita*	4
34.	Finch	*fringilla coelebs*	18
35.	Cardarina	*Carduellis carduellis*	5
36.	Kokkinolaimi	*Erithacus rubecola*	3
37.	Eagle Eagle	*Lanius collurio*	4
38.	Strawberry	*Emberiza hortulana*	2
39.	Syringa	*Emberiza cirlus*	8

*Total number of individuals observed in all methods applied

10.1.10 List of observations October

a/a	Common name	Latin name	Number of persons

1.	Xefteri	*Accipiter nisus*	3
2.	Aegithalos	*caudate aegithalus*	8
3.	Gerakina	*Buteo buteo*	1
4.	Cardarina	*Carduelis carduelis*	5
5.	(European) Florus	*chloris chloris*	5
6.	Fassa	*Columba palumbus*	20
7.	Crow	*Corvus corax*	4
8.	Cinderella	*corvus corone*	6
9.	Brahokirkejo	*Falco tinnunculus*	6
10.	Finch	*fringilla coelebs*	6
11.	Kissa	*Garrulus glandarius*	5
12.	The Monk	*Parus major*	4
13.	Carbuncle	*Phoenicurus ochruros*	2
14.	Dendrophylloxacos	*Phylloscopus collybita*	6
15.	Mavroskoufis	*Sylvia atricapilla*	1
16.	Blackbird	*Turdus merula*	5
17.	Chewing gum	*Turdus philomelos*	5
18.	Gerakotsichla	*Turdus viscivorus*	3

10.2 Photos from the field survey

Nesting sites of oak woodpeckers

Ash woodpecker (*Picus canus*)

Finch (*Fringilla coelebs*)

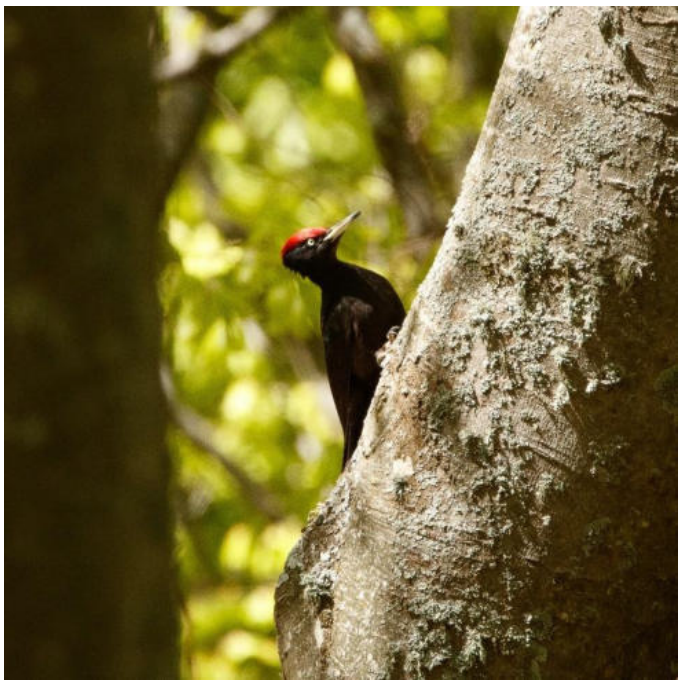
Woodcock (*Upupa epops*)

Eagle-eye (*Lanius collurio*)

Snake eagle (*Circaetus gallicus*)

Hawksbill (*Buteo buteo*)

Cecropis daurica (*Cecropis daurica*)



Black Woodpecker (*Dryocopus martius*)

Nano-backcatcher (*Dendrocopus minor*)

Magpie (*Garullus glandarius*)

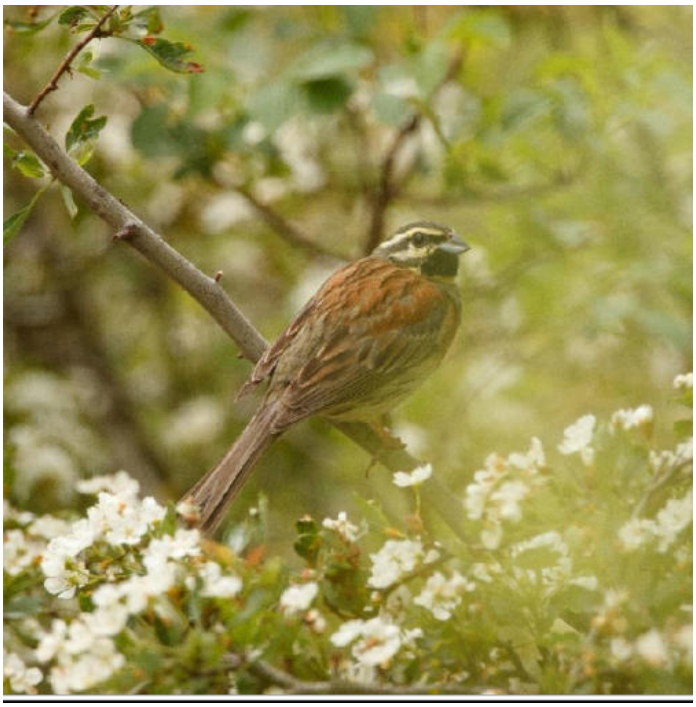
Crane (*Parus major*)

Roe deer (*Capreolus capreolus*)

Oak woodpecker (*Ficedula semitorquata*)

Blue jay (*Cyanistes caeruleus*)

Corydalis (*Emberiza hortulana*)



Cirrus (*Emberiza cirlus*)

Traces of Wild Boar (*Sus scrofa*)

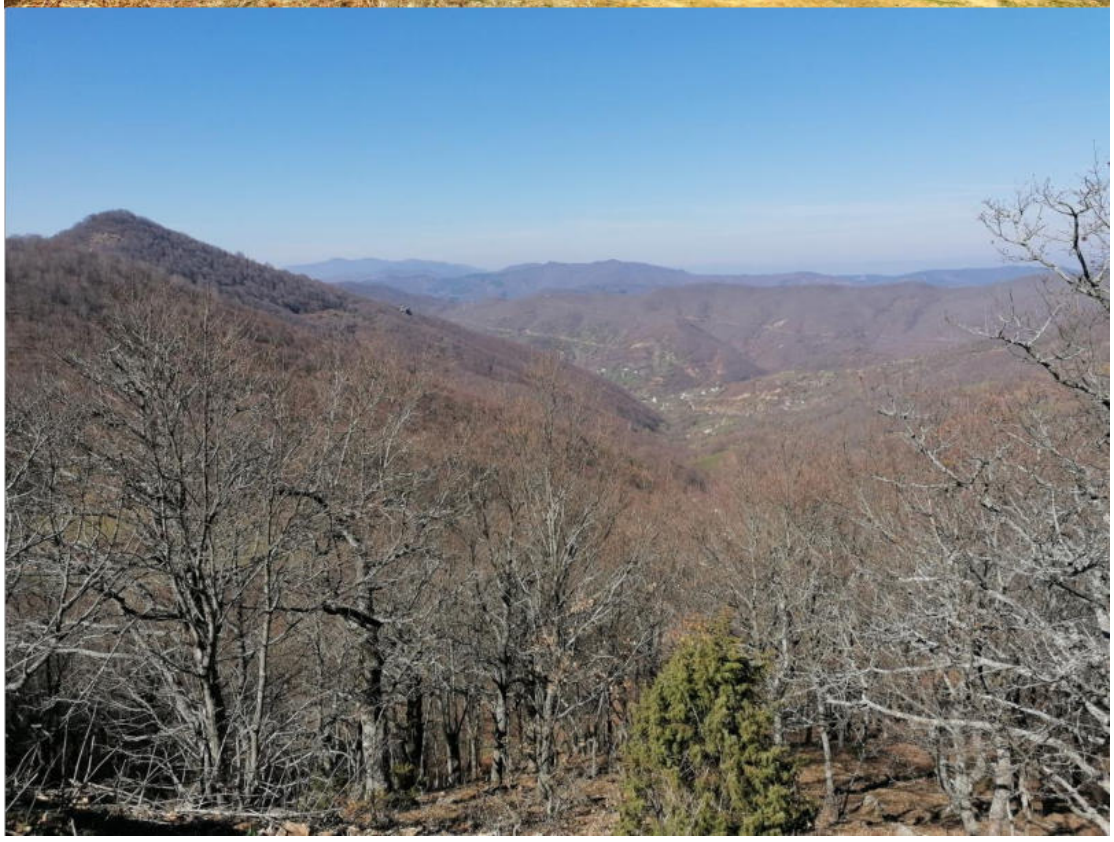
Use of a bio-acoustic station for recording nocturnal predators (top) and a mammal monitoring camera (bottom)

Use of a bioacoustic station to record nocturnal predators

Installation of recording device type BATLOGGER A in Beech

Indicative photos of the area "Warrior" using drone

Indicative photos of the area "Warrior" with the use of a camera



General photos of the area "Polemistis" using a camera, June 2023

Feeding area of the hand grabs around the "Supatzin - Ine" cave, October 2023